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ABSTRACT

The 2-year study investigated the use of word processing technology with 36 learning disabled (LD) intermediate grade children and 9 remedial teachers in five Massachusetts school districts. During the first year study staff documented how word processing was being used. In the second year, word processing activities hypothesized to be the most effective were designed and tested. Analysis resulted in a model of writing instruction with LD students and a set of student case studies which demonstrate the intersection of particular teaching approaches, the word processor, and individual LD writers. Results are interpreted in terms of: LD children's writing strengths and problems; LD students and machine skills; unique feature of word processing; instructional approaches; and most effective approaches. Of three teaching approaches--substantive instruction, procedural instruction, and direct instruction--procedural instruction in which teachers provided students with strategies for generating ideas was the most effective. The writing model suggests that all three instructional approaches have an appropriate time in the writing cycle with procedural instruction having direct effects on productivity, a sense of ownership of the writing, and metacognitive awareness. Also included is the handbook of writing activities which developed out of this research and which include using the computer as a journal, using dialogue to write stories, using interviewing to tell other people's stories, and responding in writing to contemporary events. (DB)

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Teachers, Children and the Magical Writing Machine
Instructional Contexts for Word Processing with Learning Disabled Children

Final Report

Catherine Cobb Morocco

and

"I Know What to Say!"
Writing Activites for the Magical Machine

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EC 210256

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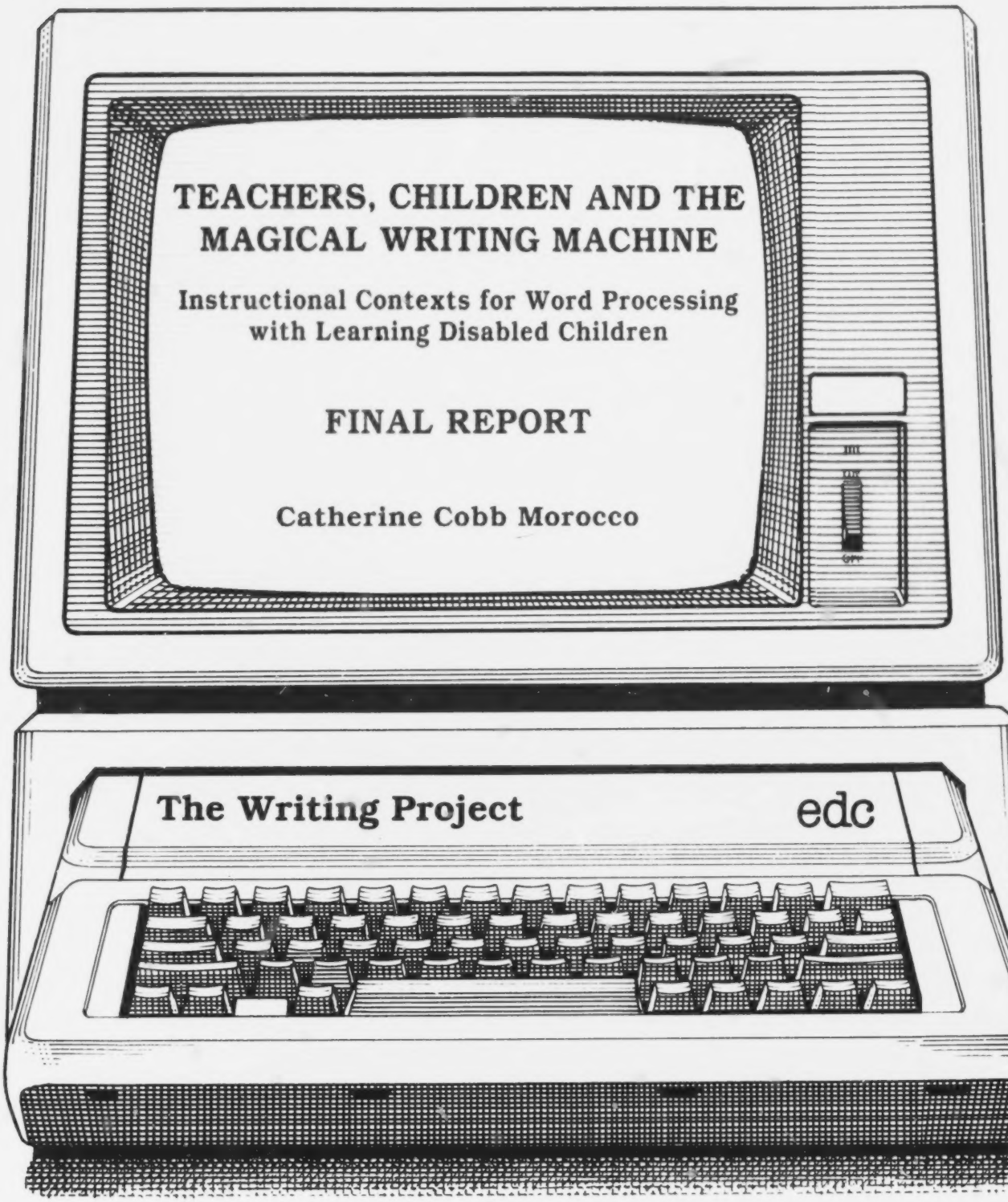
TEACHERS, CHILDREN AND THE
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with Learning Disabled Children
FINAL REPORT
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edc

Teachers, Children and the Magical Writing Machine

Instructional Contexts for Word Processing with Learning Disabled Children

FINAL REPORT

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1984-86

- Helen Cushman, Lexington Public Schools
- Debra Packard, Lexington Public Schools

1984-85

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EXECUTIVE SUMMARY

PURPOSE

Word processing offers enormous promise for learning disabled students with writing problems. The computer can potentially make composing, revising, and editing easier and more motivating for students who struggle daily with problems of attention, motivation, expression of ideas, coherence, organization, spelling, and punctuation. In order to use this exciting new tool effectively with learning disabled (LD) students, however, teachers need to learn about the writing needs of LD students, the unique features of computers as writing tools, and the ways to integrate word processing into good writing instruction.

Between 1984 and 1986 the U.S. Office of Special Education Programs funded Education Development Center, Inc. to carry out an intensive, classroom based study of word processing with LD children. Previous research has focused primarily on LD students' mechanical and spelling skills. The study builds on prior research to investigate these questions:

- What are the writing strengths and problems of learning disabled students?
- Are they able to acquire machine skills needed for word processing? What approaches help them acquire those skills?
- What is the impact of word processing on the writing abilities of learning disabled children?
- What approaches do teachers bring to teaching writing with word processing? What approaches are most effective with learning disabled children?
- What are the unique features of word processors as writing tools for learning disabled children? How can these features support good writing instruction with LD students?

METHOD

The research assumes that:

- Carrying out the research in the natural school setting will result in the most useful information for teachers.
- Teachers themselves will contribute enormously to studies of word processing by having collaborative roles in the research.
- The real and lasting benefits of using word processing will show up over time.
- Multiple data sources are required to document the integration of word processing into remedial instruction.
- Qualitative methods are highly appropriate and powerful for documenting the instruction and learning processes that take place around word processing and for identifying linkages between certain word processor uses and student writing outcomes.

Consistent with those assumptions, we conducted the research in resource rooms in five Massachusetts school districts. Over the two years, nine experienced remedial teachers, 36 LD children, and several classroom aides and LD specialists were the focus of weekly observations, ongoing interviewing and periodic review and discussion meetings. Information on students were assessed through formal writing assessments, teacher ratings, individual education plans, and extensive observation. Information on teachers' instructional approaches was gathered through periodic interviews, observing and tape recording teachers' interactions with students at the computer, and participating in monthly teacher-researcher discussion meetings.

In the first year EDC staff documented how five remedial teachers used word processors with mainstreamed fourth grade students who receive up to five hours of resource room instruction each week. In the second year, we designed and tested word processing activities, hypothesized to be the most effective with LD children. Coding of teacher interventions was carried out to identify teachers' approaches; case study analysis was carried out to learn the impact of different teacher approaches on several student outcomes: productivity, sense of ownership and metacognitive awareness. The result of that analysis is a model of writing instruction with LD students and a set of student case studies which illuminate the intersection of particular teaching approaches, the word processor, and individual LD writers.

RESULTS

LD children's writing strengths and problems.

LD children's writing profiles should include three aspects of writing: cognitive -- generating ideas, sequencing, organizing, reviewing; socio-emotional -- the ability to listen and provide feedback to other writers; self-image as a writer; and motoric -- legibility. LD students have a widely varied writing profile and therefore respond to different uses of word processing. Students whose major problem is illegible handwriting may solve their problem by doing much of their writing on a computer. Highly anxious students may produce even less original text on the computer because of the visibility of whatever they write and the ease with which they can erase. These students may need to develop confidence off the machine before using this more public writing tool. Highly creative but distractible students may thrive on composing on the word processor provided they have a structure or framework to focus their attention.

LD students and machine skills.

Learning disabled children can acquire sufficient keyboarding skills for writing if they have regular, brief opportunities to practice keyboarding skills and receive feedback on small increments of progress. Unless students learn basic word processing functions (cursor movement, capitalization, indent, back delete, space return) before beginning real composing activities, they will continually interrupt composing to get help with the software. Because of the low teacher-student ratio, LD children can gradually acquire more advance word processing functions. A writing program that builds from short expressive writing to longer, edited pieces can integrate word processing skills over a period of time.

Unique features of word processing.

The electronic writing features require that students learn keyboarding skills, but make writing easier for many students and "equalize" students with illegible handwriting. While the revision features (delete and insert text, wrap-around) did stimulate revision of spelling and mechanical errors, the major impact was on students' productivity. Students wrote more because they did not have to recopy. The most powerful features of word processing for LD

students are the "interactive" features. The open, public screen and large print makes the individual's writing process more "permeable" -- teachers can more easily see what the child is writing and makes the writing process more visible by bringing into sharp relief processes that are less apparent with paper and pencil.

Instructional approaches.

Teachers brought three different approaches to teaching writing with word processors. They collaborated directly with children in eliciting content for their writing (substantive instruction); they provided students with procedures for generating ideas (procedural instruction); and they directly taught skills or knowledge about writing rules and conventions (direct instruction).

Though remedial teachers used all three approaches, they were overwhelmingly substantive in their overall style. They frequently take part in the composing process, asking questions to elicit ideas from the child. While this approach can help very anxious students develop initial confidence, it reinforces students' "learned helplessness" by making them dependent on the teacher for helping them find what to say next. The computer exacerbates the limitations of a substantive approach by making the child's text highly visible and thereby encouraging the substantive teacher to direct the composing process.

Most effective approaches.

Three case studies provide a "microanalysis" of the impact of different teaching approaches on students' use of word processing. In all three cases teachers' substantive interventions were less effective than their procedural interventions on students' ability to generate ideas and complete a first draft. Teachers were at their best when they provided students specific strategies for generating ideas, such as observation guides, story frames, interviewing structures, organizing procedures. Students can generalize these procedures to other writing situations, particularly in the mainstream classroom, where they cannot rely on adults to draw ideas from them. The computer facilitates procedural interventions by making the child's writing process, and therefore his need for a prompting strategy, more visible.

A major outcome of the study is an emerging model of writing instruction with LD children that applies to both paper and pencil and word processing environments. The model suggests that each of the three major instructional approaches has an appropriate time in the writing cycle. Substantive instruction is appropriate at the beginning of the cycle for the most low-writing student and once the child has established a plan. Direct instruction is most appropriate after the child has completed his text. Procedural instruction is critical at all stages, because it teaches the child how to manage each stage. The model portrays specific linkages between procedural instruction and many of the writing outcomes that are critical for LD students; productivity (number of words), a sense of ownership of the writing, and metacognitive awareness.

Overall, the study documents the power of procedural writing instruction for LD students, and argues for a greater use of procedural instruction in resource rooms. Further research should focus on the patterns of instruction within mainstream classrooms and computer labs, where learning disabled students use computers for writing. If procedural instruction is beneficial in the resource room, it is likely to be even more critical in a setting which requires independent writing on the part of the LD child.

I. PURPOSE

THE NEED

The special education community has viewed the steady movement of computers into schools with both excitement and reservation. Computer technology offers enormous promise for students with mild to severe handicaps yet requires that teachers and specialists learn not only the technology itself but also how best to use it so that it can benefit individual children.

Word processing is one of the most promising of the new technologies for special needs children, and particularly for those with learning disabilities. Despite normal intelligence, LD students often struggle with writing. By the fourth grade, many begin to slip behind their classmates in those learning areas that require writing skills. Their writing difficulties take many different forms -- some children are hampered by attentional problems, others by problems with understanding directions, expressing a coherent sequence of ideas, or using correct grammar and spelling. Whatever the specific writing problems, they share the frustration of not being able to express their ideas in writing.

Early reports describing the use of word processing with individual students suggested that word processing motivates reluctant writers, replaces illegible handwriting with clear print, and stimulates students to write and revise more. These promising reports motivated many administrators to purchase computers for resource rooms and to provide related staff development programs for remedial teachers. Because word processing programs are merely writing tools, however, even the most adventurous of teachers face many questions about how best to use them.

To integrate word processing into resource room instruction, remedial teachers need additional knowledge about their LD students. They ask, what kinds of writing problems do the children who come to the resource room have? Which of these problems can be helped by writing with a word processor? Do problems

with motor control or attention prevent LD students from learning the machine skills needed for word processing? Can they type fast enough to write fluently? Will students write more? Will the quality of writing and their feelings about themselves as writers improve?

Teachers need information about appropriate methods. What do they need to know in order to teach writing with word processors? What is the best way to teach keyboarding and word processing skills? Can they use the same kinds of activities and instructional approaches that they use when students work with paper and pencil? Which aspects of writing -- exercises, composing, editing -- are appropriate for the computer? Teachers ask what they also need to know about the computer. How is it different from paper and pencil as a tool for learning? What does it offer special needs students?

BACKGROUND

In 1984 OSEP funded Education Development Center to investigate how word processing can benefit learning disabled children. For two years we worked closely with resource room teachers and fourth and fifth grade students documenting how teachers use word processing and exploring approaches that we hypothesized would have the most benefit for students. We built the study on three areas of prior research: the LD writer, writing instruction and word processing.

Children: LD Students' Writing Needs

LD students' problems with spelling and punctuation (mechanics) have been well documented (Poteet 1978; Hemreck 1979; Poplin et al 1980; Deloach et al 1981; Deno, Marston and Mirkin 1982). Some recent research points to a broader range of problems: motor control and legibility; productivity (Myklebust 1973); attention, fluency, and organization (Neale, Cushman, Packard 1985); and some aspects of syntax, word usage, and style (Poplin et al 1980). Some research documents problems with LD students' pragmatic, oral communication

skills (Bryan et al 1976; Bryan and Pflaum 1978; Donahue, Pearl, and Bryan 1980; Olsen, Wong, and Marx 1983; Knight-Arest 1984). This latter research points out differences between LD students with strong oral skills but difficulty with writing and students with more basic language problems that show up in both speaking and writing.

Several new lines of research are converging around an important area of LD children's writing -- metacognition. Although metacognition is not a new area of study in psychology (Vygotsky 1962; Flavell 1978), it is a recent focus for writing research. It refers to our ability to think about our own thinking -- our ability to plan a strategy for producing what information is needed and to be conscious of our thinking during problem-solving (Flower and Hayes 1980, 1981a, 1981b; Applebee 1982; Costa 1984). Metacognition shows up in writing in the writer's awareness and use of strategies to retrieve and organize information, narrow and focus a topic, and review writing to expand or improve it (Applebee 1982).

By the fourth and fifth grade, LD children may lag behind their normally achieving peers in using such strategies in planning, transcribing and reviewing their writing. This would help to explain why LD students have so much difficulty in getting started in writing and run out of ideas quickly (Haynes et al 1984; Loper 1984; Thomas 1984). It would also help to explain the "learned helplessness that characterizes LD and low achieving students (Dweck and Licht 1980).

Overall, prior research alerts us to focus on a broad range of LD writing skills. EDC's study goes beyond this prior work in exploring how word processing can help LD students acquire writing abilities ranging from mechanical skills to metacognitive awareness. Further research may find that the writing problems of LD students are not primarily in metacognition; nevertheless, students' ability to consciously think about and guide their own writing process will be critical for LD students with problems in generating, organizing and reviewing their writing.

Teachers: Good Writing Instruction

Recent research in writing confirms that writing involves thinking, social interaction and motoric skills. Several guidelines for "good" writing instruction have been found to foster these three elements. These guidelines should apply to LD students as much as to non-LD students:

- Process. Writing is best taught by having children write, rather than by studying grammar or isolated language elements (Braddock, Lloyd-Jones and Schoer 1963; White 1965; Whitehead 1966; Bowden 1979; Sullivan 1969; Elley 1976; Graves 1983).

- Ownership. Students need opportunities to find what they want to say, rather than complying with another's topic and writing agenda (Calkins 1986; Langer and Applebee 1986).

- Collaboration. Students can learn appropriate listening and response strategies that advance one another's work (Freedman, 1985; Levin, Riel, Rowe and Boruta 1986). In working with their students, teachers need to place less emphasis on evaluating students' writing and more on supporting the child's own planning and idea generating (Langer and Applebee 1986).

- Skills. Students need to acquire a knowledge of the spelling, mechanics, and formatting conventions of their "writing community." Students master these by applying them to their own composing, after they have focused on what they want to say.

- Procedures. Good instruction gives students procedures and structures that help them manage the complex demands of writing. They need opportunities to internalize those procedures and use them independently in a variety of contexts. (Langer and Applebee 1986; Bereiter and Scardamalia 1982.) Students' mastery and awareness of those strategies is the heart of the metacognitive abilities discussed above.

Prior research on writing instruction alerts us to what is important in teaching writing. This study builds on that research by studying how remedial teachers can integrate the elements above into word processing in the resource room.

Computers: Word Processing with LD Children

A small body of research has begun to document the effects of word processing on younger students. Researchers find that writing on the machine focuses younger students' attention on writing (Marcus 1984; Newman 1984; Goodman

1983) A number of studies have focused on the unique revision features of the computer and their impact on the students' revision processes. Daiute (1985) finds that students make more surface level revisions (e.g., mechanics), as a result of the insert, delete and wrap-around features. The instructional conditions that might contribute to the use of word processing for content level revisions are yet to be identified.

Prior research has paid little attention to the impact of word processor features on students' actual composing process. Electronic writing transforms handwriting into print; the monitor makes the child's writing highly visible to others; cursor movement enables the writer to start in the middle of a story rather than following a linear writing model. We know little about the impact of these combined features on the amount and the way younger children compose. Recent work by Daiute (1986) and Daiute and Dalton (in press) take a step in this direction in studying the word processor as an environment for collaboration in writing. Our own research focused primarily on how the unique "composing" features of the word processor can support learning disabled students in composing -- particularly in generating ideas for writing.

Several studies point out the critical impact that the instructional context can have on the use of word processing. Computer based writing activities can, for example, either limit or foster the amount of spontaneous collaboration that takes place between children during writing, depending on the teacher's focus and ways the computer is used for writing (Cazden, Michaels, and Watson-Gegeo 1984; Levin and Boruta 1983; Riel 1982, 1984).

Prior research alerts us to the importance of the teacher, but does not specify alternative approaches that teachers might take to integrating the computer into writing. Nor has prior research focused on the specific ways remedial teachers currently use word processing.

The challenge for our research is to learn how teachers can integrate word processing into good writing instruction, and how that writing environment can meet a broad range of writing needs in learning disabled children.

FRAMEWORK AND QUESTIONS

The framework for this study (see Exhibit 1) reflects the intersection of the three "actors" discussed above -- child, teacher and computer -- and the centrality of the teacher in effective use of word processing.

The overarching questions of the research reflect the three "actors:"

> Children: What are the writing strengths and problems of learning disabled students?
>
> Are they able to acquire machine skills needed for word processing? What approaches help them acquire those skills?
>
> What is the impact of word processing on the writing abilities of learning disabled children?
>
> Teachers: What approaches do teachers bring to teaching writing with word processing? What approaches are most effective? Does a word processing environment change teachers' approaches?
>
> Computers: What are the unique features of word processors as writing tools for learning disabled children? How can these features support good writing instruction with learning disabled children?

A number of earlier, interim reports from this research presented our preliminary findings. Each addresses one or more of the issues shown in Exhibit 2. This report integrates findings of the two years of research. It is organized around a major theme that emerged from our intensive investigation: the approach teachers bring to writing instruction shapes the ways they use word processors and the impact that word processing has on students.

Section II - Methods - provides an overview of the methods used to carry out the study. Interested readers will find a more detailed discussion on design, data gathering and methods of analysis in the Appendix. Sections II and IV together present findings which elaborate the major theme. The Results Section give an overview of our major findings related to children, teachers, and computers. The section on children briefly describes the writing needs of LD children and their capabilities for learning the requisite machine skills for word processing. The section on teachers discusses the ways teachers focus their instruction during word processing activities on:

EXHIBIT 1

Conceptual Framework

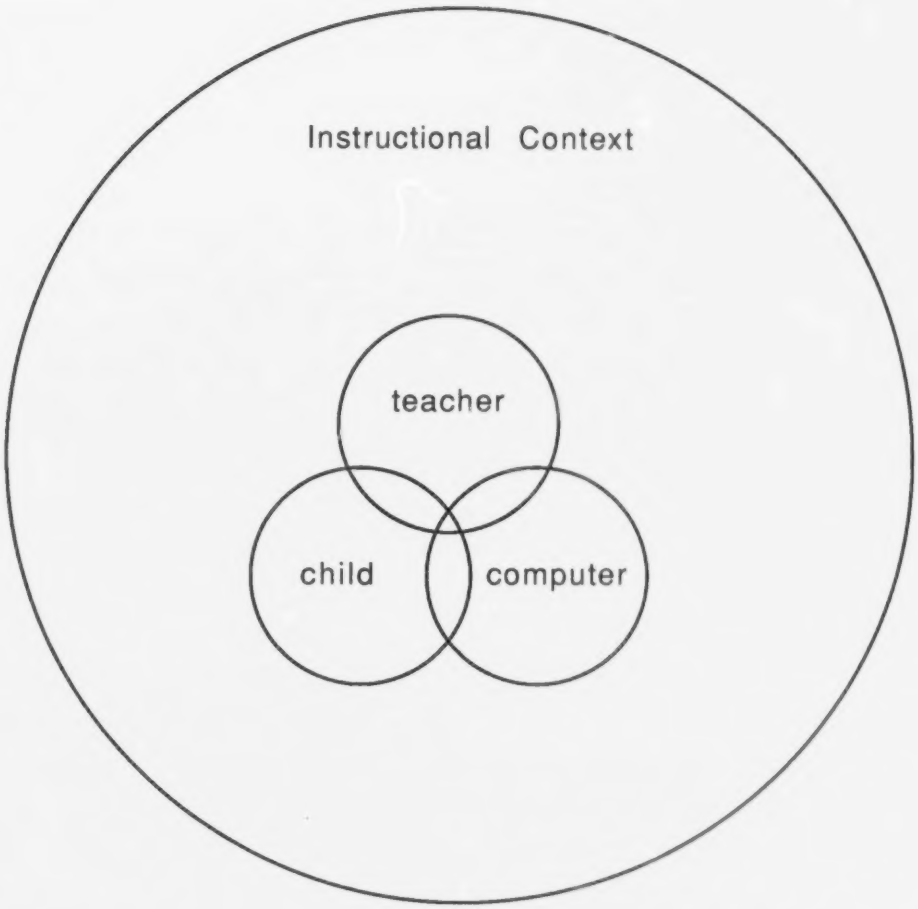


EXHIBIT 2

Writing Project Reports*

Title	Focus
Technical Report 1 Teaching Children to Write with Computers: Comparing Approaches 1985	Preliminary identification of three teaching approaches used to teach writing with word processing
Technical Report 2 A Model Teaching Environment for Using Word Processors with LD Children 1985	Model of "compliance" orientation vs. "facilitative" orientation to teaching writing with word processing
Technical Report 3 Word Processors and the Acquisition of Writing Strategies (Also published in Journal of Learning Disabilities, Vol. 19, No. 4, April 1986, 193-256.	Description of the impact of the public character of the computer on the child's word processing writing
Technical Report 4 "Two Hands is Hard for Me": Keyboarding and Learning Disabled Children 1986	Description of the keyboarding problems of LD students and recommendations for teachers regarding keyboarding
Technical Report 5 Children and Word Processing 1986	Identification of the three general features of word processing and their benefits and pitfalls for LD children
"I Know What to Say!" Writing Activities for the Magical Machine	A series of activity modules, field tested in remedial settings to help LD students get started with expressive, functional, and poetic writing activities

* All technical reports are co-authored by Catherine Cobb Morocco and Susan B. Neuman .

- What to write (substantive instruction)
- How to write (procedural instruction)
- Writing rules and conventions (direct instruction)

The section on computers discusses three sets of unique features of word processor as writing tools and how they can support the three approaches to writing instruction.

The focal point of the report is the set of three case studies which integrate our findings related to individual student writing needs, unique word processor features, and effective teaching approaches. The cases illustrate the special impact that a procedural approach to writing instruction, combined with word processing, can have on LD students' writing. The three richly detailed stories contribute to our general theory about writing instruction for learning disabled students by pointing out the specific linkages between the strategies or procedures students use in carrying out the writing process and their growth as writers.

Finally, Sections V and VI present suggestions to teachers, based on the research findings, and ways we are disseminating results.

II. METHODS

ASSUMPTIONS

We designed the research around several assumptions:

- Carrying out research in the natural school setting will result in the most useful information for teachers.
- Teachers themselves may contribute enormously to studies of word processing by having collaborative roles in the research.
- The real and lasting benefits of using word processing will show up over time.
- Multiple data sources are required to document the integration of word processing into remedial instruction.
- Qualitative methods are highly appropriate and powerful for documenting the instruction and learning processes that take place around word processing, and for identifying linkages between certain word processor uses and student writing outcomes.
- Writing is a communicative act, and above all is a thinking process.

Consistent with these assumptions, we conducted the research in resource rooms over two full school years and created collaborative roles for teachers. We gathered many kinds of information, including intensive classroom observation, interviews, writing assessments and teacher interviews, and used primarily qualitative methods for documenting teachers' use of word processing. We designed writing assessments and field tested model writing activities that integrated different kinds of problem-solving -- reflecting our view of writing as basically a thinking process.

RESEARCH DESIGN

We conducted the research in remedial classrooms in elementary schools in Massachusetts. We worked over the course of two years, in five school systems representing broad demographic diversity. Over the two years, nine remedial teachers, 36 children, and several classroom aides and LD specialists were the

focus of weekly observations, ongoing interviewing, and periodic review and discussion meetings. Participating teachers were highly experienced, were considered exemplary teachers by their administrators, and were "pioneer" users of computers with special needs children in their systems. Participating children were all a year or more behind their classmates in writing skills. They varied in their socioeconomic and ethnic backgrounds and in the particular profiles of learner and writer strengths and problems they brought into the project.

In the first year, EDC staff observed five teachers to document how they used word processors with their students. In each setting we selected two to four LD students for inclusion in the study. The ratio of computers to children varied across the five classrooms: two classrooms had one computer for three children and three had one computer per child. In one classroom an aide was available to assist the teacher with the four LD students as they wrote at the computer. Writing sessions ranged from 45 minutes to one hour in length, two to four times per week. Teachers generally worked with one to three children at a time.

We gathered information about teachers' instructional approaches by interviewing them about their teaching philosophies, perceptions of LD students, assessments of specific students' writing, and views about how the research project was affecting their teaching. In addition, we regularly observed teachers working with LD children at computers and tape-recorded their conversations. Finally, teachers and researchers met together monthly at EDC to share ideas about using word processing.

We obtained information on the LD children in our sample by observing them and keeping running records of their responses to different writing tasks. In addition, we gathered several writing samples from each child at the beginning and end of the year, and had teachers rate each child on several dimensions as a learner and as a writer.

At the end of Year I, we drew on our interview and observation data to describe teachers' approaches. We identified verbal intervention techniques that teachers used, such as different ways of prompting students to write

more. We drew on observations of students to identify their level of mastery of word processing skills and the kinds of practice that seemed to help. We identified all the ways the computer was integrated into the writing process that year, and differentiated between word processor uses that seemed to help and hinder students. We discussed these preliminary analyses with teachers and integrated their insights into early technical reports.

In the second year, we shifted from observing what good teachers naturally do with word processing to testing out a series of carefully designed word processing activities that we hypothesized to be the most effective with LD children. We selected two teachers from the first year group as "core" teachers to help us develop the activities, try them out with their students, and determine which were most successful with different students. Both core teachers were in the same school, working with students at the fourth and fifth grade levels. Half of the eight students selected for study in Year II had also participated in the Year I study. A second group of teachers from the first year and four new teachers field tested revised versions of these activities in additional resource rooms. An additional 12 students were observed in these classrooms and teachers participated in bi-weekly interviews about their use of the materials.

At the end of Year II we analyzed all observation and interview data across the two years to refine our characterization of teachers' instructional approaches and to determine whether teachers involved with the project for some time had changed their approaches in any way. We analyzed observational protocols for all of the model activities field tested in Year II to set guidelines for revising and expanding these "idea-generating" activities. Finally, we integrated the multiple data sets on individual students, some of whom had participated in the project for two years, to characterize the ways word processing can affect the writing process of children with extremely diverse writing problems. This case study analysis resulted in a model of writing instruction for learning disabled children, which can guide teachers and specialists in creating an effective word processing environment. (See the appendix for additional details about the overall research design, including sampling data collection and analysis.)

INSTRUCTIONAL MATERIALS

In Year II, a major aim of our work was to develop, field test, and revise a set of computer based writing activities for teachers to use with LD children. The activities were initially designed to reflect several elements of good writing instruction described in Section I. Our purpose was to develop writing activities which integrated the three basic dimensions of the project: attention to the special writing problems of learning disabled children, and unique features of the word processor and good writing instruction. Based on observations of how teachers used and adapted these activities, we refined our specific understanding of each of the three dimensions. With teacher feedback, we revised the activities and created additional ones. Our aim, out of a collaborative relationship between teacher and researcher, was to produce specific strategies for integrating word processing into writing instruction for LD elementary school students that could be disseminated to other remedial teachers.

The activities focus on a major writing problem of the LD children in our sample--generating ideas for writing. Activities provide students with a number of strategies such as remembering, observing, describing, generating vocabulary, interviewing others, and identifying their own areas of interest and expertise. This approach reflects our assumption that LD children have ideas to express but need knowledge of how to go about eliciting and organizing those ideas in order to write.

The preliminary activities were designed as modules, each including a series of writing activities. Each module began with idea-generating activities and progressed to a longer composition. We offered suggestions for having students form pairs or small groups to discuss drafts. Lists of books with relevant themes were included for teachers to integrate into the writing activities. For example, when students are writing descriptions based on memories, the teacher may read aloud one or more books based on a similar approach.

The activities also integrated features of the word processor identified in our Year I data analyses as powerful in LD writing instruction. For example, we found that electronic print and the upright monitor facilitates an exchange of ideas. One activity which utilized these features was a descriptive writing activity. Students write "tactile riddles" by typing out the tactile attributes of a secret object each holds in a paper bag. Exchanging computers, students type their guesses onto one another's monitors. They then talk about which details provided useful clues, and which "gave it away." In another activity, aimed simply at helping students compose more fluently (i.e., at a greater number of words per minute), students "converse" on the computer about whether they like using the computer as their writing tool. Because all of the writing is in print in these activities, the focus is on what they have written, rather than on handwriting.

Writing activities represented the three major kinds of writing that fourth grade children need to learn, (Britton 1975). Expressive writing activities included a "Personal Data File" (on-line journal), sensory writing, and memory writing. Functional writing modules included a "Reporter at Large" project, in which students surveyed and wrote about television viewing behavior of students in their school, and "You're the Expert", an activity in which students write instructions on how to do or make something (e.g., teach basketball to children; make a crab trap). Poetic writing modules included writing fairy tales and fiction.

The outcome of this development and field testing is a revised set of writing activities which is available for teachers. Titled, "I know what to say!" Writing Activities for the Magical Machine," the activities can be obtained from Education Development Center.

III. RESULTS: CHILDREN, TEACHERS, COMPUTERS

CHILDREN

This section summarizes our findings related to the first research questions outlined in Section I -- What are the writing strengths and problems of learning disabled students? Are they able to acquire machine skills needed for word processing? What approaches help them acquire those skills? The final student-related question -- What is the impact of word processing on the writing abilities of learning disabled children? -- is addressed at length in the case study section.

Writing Strengths and Problems

During both years of the project we gathered information about students' writing strengths and problems from several sources:

- Teachers ratings of students as learners (e.g. motivation to learn; confidence as a learner; extroversion/introversion with peers) and as writers. In asking teachers to rate their students as writers we included three general characteristics: cognitive (generates ideas, organizes information, transcribes spoken ideas into writing, uses mature vocabulary in writing), socio-emotional (enjoys writing, self-image as writer) and motoric (consistency, legibility of handwriting).

- Individual Education Plans and school records provided standard test scores in related areas of reading comprehension, vocabulary, and the school's objectives for students' writing.

- Writing assessments using stimuli and procedures from the National Assessment of Educational Progress (NAEP). We gathered three writing samples in the fall and three in the spring. We analyzed the samples holistically (judging overall quality) using criteria suggested by Educational Testing Service, and analyzed each sample for number of words, number of unique vocabulary words, number of "mature" vocabulary words (Cooper and Odell 1977), T-units (number of complete thoughts), and sentence complexity.

- Finally, we observed students each week during writing assigments and throughout the school year.

There were three important results of this information gathering. First, we confirmed that learning disabled students' strengths and problems do in fact span a wide range of lower-level to higher-level abilities. The strengths and problems included recalling information, expressing ideas orally, generating ideas for writing, organizing and sequencing information, writing fluently, sustaining attention and motivation for writing, and managing spelling and mechanics.

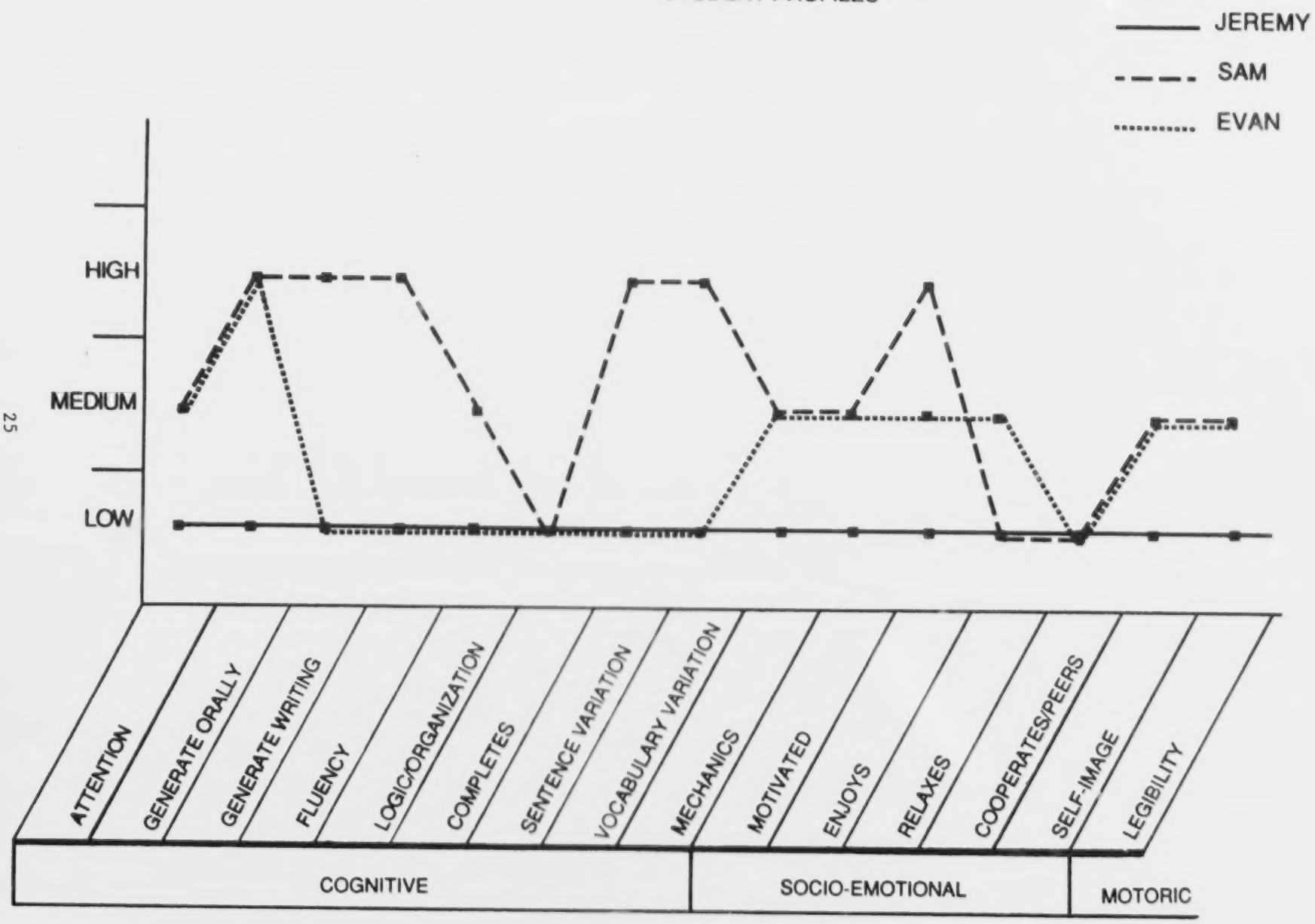
Second, we confirmed that the patterns, or constellation of writing strengths and problems for individual students is highly diverse. Some students have strong abilities in recalling information and generating ideas, but are too easily distracted to produce very much text, while others are motivated and persistent but produce very general or limited ideas. Some produce highly imaginative, well-formed writing with extremely poor spelling and mechanics; others have good "rote" skills in punctuation and spelling, but have difficulty generating ideas. This diversity contributes to the difficulty teachers face in working with learning disabled writers.

Third, we developed a tool for summarizing and comparing individual students' writing strenths and needs (see Profile, Exhibit 3). The profile includes sixteen of the dimensions we found most helpful in characterizing students' writing. The dimensions cut across the cognitive, socio-emotional and motoric areas. A simple distinction between low, middle and high, while not useful for detailed diagnostic purposes, or for close clinical work with individual children, served our need as researchers to highlight major strengths and problems and provide a way to compare students.

This sample profile presents the three very different profiles of the students in the case studies that follow. Each student has a different pattern of strengths and needs. In presentations of preliminary findings at conferences, teachers have expressed strong interest in this profile as a tool for organizing their information and observations of their LD writers.

Exhibit 3

STUDENT PROFILES



Learning Disabled Students and Machine Skills

With very few exceptions, the students who participated in the research project over the two years preferred the computer to handwriting, even while they were in the process of acquiring keyboarding and word processing skills. A dyslexic girl who learned the location of the keys very slowly was somewhat less enthusiastic about writing on the computer than the other LD students in her resource room. Another boy became highly frustrated with hunting for keys and eventually preferred to write by hand. This boy was in a resource room during the first year of the study, in which the teacher provided no orientation or practice in keyboarding, and where students were actually writing on the computer for only one class period per week.

We have found that to reap the benefits of electronic writing, students need to practice keyboarding -- typing skills on the computer. Currently there are three untested theories about children and keyboarding. One is that children do not need training in keyboarding, because they gradually learn letter positions in the process of writing. Another is that although children do not need training in touch typing, regular keyboard training is needed to build good typing habits that let them write fluently. A third is that children are capable of learning touch typing and need it in order to maximize the benefits of the computer.

Our analysis of machine skill acquisition is exploratory, since the study was not designed to provide systematic data on this issue. In reviewing observation data about students' machine skills, observations of teaching interventions related to keyboarding, and teacher reports at the end of the first year, we drew several conclusions:

- Most LD students are able to acquire a basic level of keyboarding and word processing skills provided they receive instruction about word processing functions, guided practice on hand placement and key location, and regular opportunities to write on the computer.
- Students with motor control difficulties are most in need of regular, relaxed opportunities to develop comfort with keyboarding.
- Students with no training in hand placement or key location tend to develop poor keyboarding habits that may hamper the acquisition of fluency in composing on the computer.

- While fourth grade students took several months to acquire good knowledge of the keyboard, those same students were fluent in keyboarding and in managing functions such as SAVE, RETRIEVE, and PRINT when they began the fifth grade.

- Keyboarding software needs to have a simple format, which shows key location, but does not require attention to multiple kinds of information. Software that requires students to look at letters to be copied, a keyboard, a pair of hands, and a representation of the letters they had typed was too complex for most students to follow.

We find that students stay highly engaged in keyboarding practice if it is a short (ten minutes), routinized part of every writing session during their first year at the computer and if the software gives them feedback on their progress. If the goal is letter familiarity rather than touch typing, then students should be monitored so that they keep both hands hovering over home row, and reach with the nearest finger. For highly anxious students, keyboard drills can become just one more pressured learning situation. Software that provides three scores--words per minute, total number of errors, and correct words per minute--can encourage the child by reflecting back even small increments of progress.

TEACHERS

One major focus of the study was how teachers use word processing in their writing instruction with LD children. By the end of Year I, we tentatively identified several basic approaches to using word processors. We built on that analysis in Year II by coding two teachers' verbal interactions with students in a sample of two years of observation transcripts. We assumed that teachers' ongoing dialogues with students represent their basic approach to teaching writing.

In this section we draw on that analysis to address the first two overall research questions on teachers presented in Section I: What approaches do teachers bring to teaching writing with word processors? What approaches are most effective? Does a word processing environment change teachers' approaches?

Three Approaches

Participating teachers used three different instructional approaches with word processing. Borrowing Bereiter's (1980) terms, they were:

- Substantive. They collaborated directly with the child in generating content for their writing.
- Procedural. They provided students procedures or strategies that they could use themselves in generating ideas.
- Direct. They directly taught students skills or knowledge about writing rules and conventions.

We found that while participating teachers primarily used the substantive approach, their procedural teaching was most effective in helping students generate ideas for composing.

Substantive Instruction

In "substantive dialogues" teachers and students talk about the content of the students' writing--what they have said and what they can say next. The teacher and child generate topics and ideas together, decide which ideas should come first, or determine exactly what words to use. In the example below, the teacher thinks of topics or questions and the child supplies what he/she knows about them.

T: Let's think of questions we could ask about snow.
S: It falls out of the sky.
T: Great. Write it down. What else?
S: It's slushy.
T: Fantastic, write it down. Great. How does it fall?
S: I like to play with it.
T: Fantastic.

The teacher's questions help the child discover what he/she already knows. With each question the teacher takes the content to the next step.

In another example, the student writes a few lines, then the teacher mirrors back the reader's excitement, prompting the student to write more.

S: (writes) "His mouth pulls down in a crooked line."

T: Wow! That is scary! I'd like to know more about him.

The teacher provides many different conversational supports to help students remember what they know. These include prompts, mirroring, praising, reading the students' work aloud, having the student read aloud, having the student "rehearse" his ideas. One assumption of these "tutorial" conversations is that LD students have a good deal of knowledge but need assistance in getting at that knowledge. In substantive instruction teachers take part in the writing process, helping the child find what to write.

Substantive dialogues can help children who are particularly anxious and reluctant to begin to write. In the "snow" example above, it is likely that this was the only approach that would help this child realize that she does have something to say in writing. It can also help children expand their ideas during composing when they come to the end of a train of thought and need help in getting started again.

The pitfall of the substantive approach is that over time a predominantly substantive approach tends to be teacher-dependent and places direction of the composing with the teacher. It can shift ownership of the writing from child to teacher. A substantive dialogue is situation specific. As a result, a predominantly substantive approach does not provide the child with tools to take into another writing situation where intensive collaboration is not available.

Procedural Instruction

In "procedural" dialogues teachers and students talk about a strategy, routine, or procedure that the child could use for carrying out some aspect of the writing process. Usually it is a conversation about how to write, rather than what to write. In the example below, the teacher reminds the child of a self-questioning routine they have previously used to help the child stay on his topic.

T: Remember what you stated in that first sentence. You've got to stick to that idea. Ask yourself, am I sticking to the idea that I presented in my first sentence?

S: (echoes) Am I sticking to the idea that I started off with?

In another procedural conversation, when the teacher reminds a student of a strategy they have worked out for writing a character description, he tells her his own variation on that procedure.

Harry is at the computer to write a transformer character sketch. He types 'You can never count on Long Hall to carry out missions. Long Hall wants to be in control of the Devastator.'

T: (walks over) Remember that in a character sketch we should describe the inside as well as the outside.

S: Yeah, I always describe the outside last.

Procedures may include ways to plan, organize, conference, revise, or edit, or routines to help students put one aspect of the writing task aside so that they can focus on another one. For example, to help one student maintain fluent composing despite spelling problems, a teacher had the student asterisk any words whose spelling he wasn't sure of and then go back to them when the draft was finished. These procedures help students focus on one aspect of writing at a time and shift to another when appropriate.

Procedural dialogues assume that if the writer has a way to manage some of the cognitive, executive demands of writing, he will come up with content and ways to solve the communication needs of the writing task. A procedural approach gives students strategies they can use in any writing situation. A memory strategy can help a child recall what he already knows about a topic. A self-questioning routine can help a child reread her text for punctuation errors (When I read this aloud, where do I stop? Do I need a period there?); once she learns that strategy, she can use it in any context where correct punctuation is an issue.

Procedural instruction is not the only useful approach with LD children, but it gives LD children powerful tools for managing writing tasks in situations where they cannot rely on an adult to elicit ideas from them.

Direct Instruction

In "direct" dialogues teachers transmit skills related to good writing and knowledge of writing conventions, including spelling, rules for mechanics or word use, common wisdom about well-formed writing, or formatting conventions directly to students. In the direct dialogue below, the teacher is imparting a rule about double negatives.

T: Okay, I want you to say this part of the sentence.

S: (reads) I thought that I did not get no toys.

T: Does that sound right? What's the word that's telling you you couldn't get the toys?

S: Didn't.

T: Did not. Okay. What you did by putting the no here you told the reader twice that you didn't get toys. You don't need to tell them twice because you already said it.

S: I didn't get any toys.

T: I'm proud of you.

In another example, a teacher is imparting information about effective leads in a report:

T: Really, a good lead has three characteristics. It's punchy--you know, you pay attention, you want to read more. Second, it's usually brief. You don't want the reader to have to work through a long sentence and complex idea. Three, it tells just enough to hook you, but you want to read more. Got it? Now, you try some.

Teachers use a wide range of specific techniques in direct instruction--simple presentation, modeling, demonstration, role-play. What makes the techniques direct is the intent of providing highly specific, delineated skills and information students need to write well.

Direct instruction is important in providing children the information, skills, and shared "wisdom" about good writing of the larger writing community that they need in order to eventually participate fully in it. Direct instruction

needs to be appropriately timed, however. Learning disabled students are particularly distracted by a request to attend to punctuation rules while they are in the process of generating ideas. Requests that they think about the form of what they are writing ("Is that a complete sentence?") shift their attention from what they are trying to communicate. If timed appropriately, however, demonstrations of new writing skills can give students a concrete sense of mastery of writing.

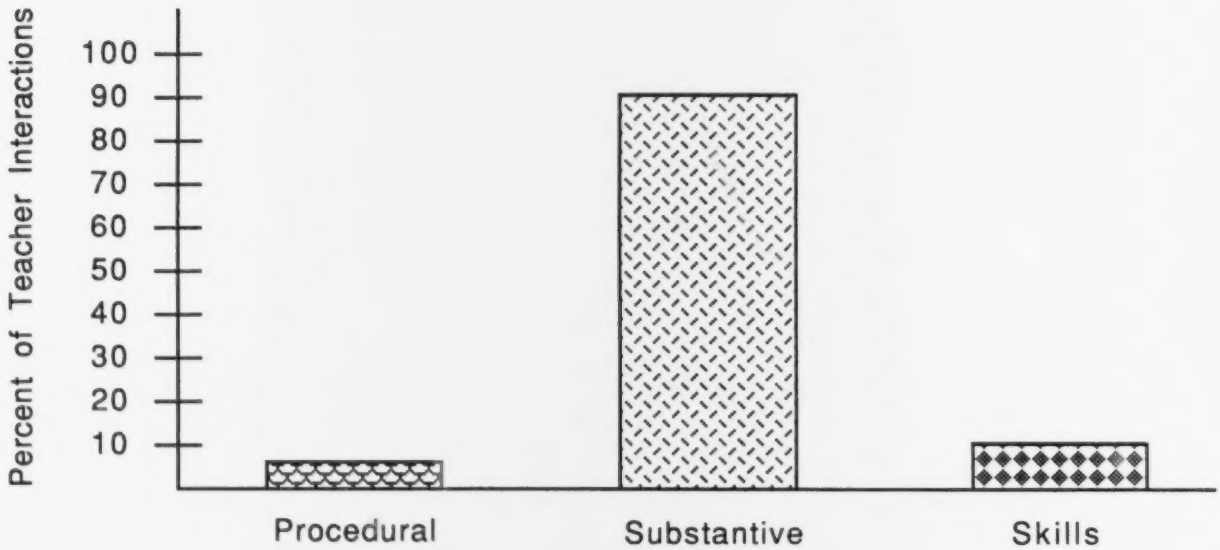
Each kind of instruction has a role to play, and can be integrated into writing instruction with LD children. Interestingly, our data suggests that the substantive approach is characteristic of most resource room teachers' styles. The most frequent interaction between teacher and child by far is one in which the teacher draws out the child's ideas, step by step. This predilection toward substantive instruction is illustrated most dramatically in the profiles of two teachers who participated in the project over a two-year period. An analysis of both teachers' conversations with their LD students during writing during the first year shows that both are overwhelmingly substantive. The graphs in Exhibit 4 indicate that 92 percent of one teachers' interactions (in a random sample of 12 classroom writing sessions) and 72 percent of the other teacher's interactions were substantive. Both teachers interacted frequently with their LD students. This was a reflection of their substantive approach, which involved extensive use of questions, prompts and praise as the student was writing. Teacher A averaged twenty verbal interactions with each LD student per writing session where "interaction" defined as one speaking "turn". Teacher B averaged thirteen (see Exhibit 5).

It appears that a substantive approach is also a fairly enduring and persistent approach. In analyzing a random sample of twelve classroom writing sessions over the second year, and comparing first and second year results, we found that both teachers maintained a predominantly substantive approach (See Exhibit 6). The slightly greater balance of procedural and skills teaching may have been influenced by the model writing activities that teachers were piloting in the second year. The activities included many specific prewriting strategies aimed at helping students generate ideas for writing, and

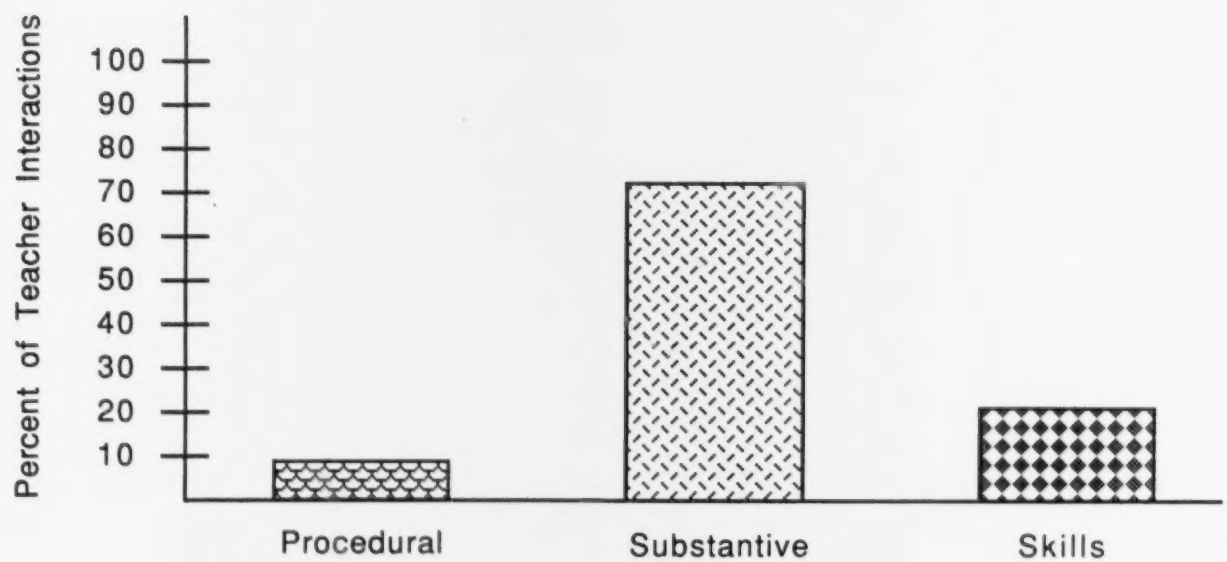
EXHIBIT 4

Instruction Approach

Year I



TEACHER A



TEACHER B

EXHIBIT 5

Average Number of Teacher Interactions Per Student Per Writing Session

Year 1

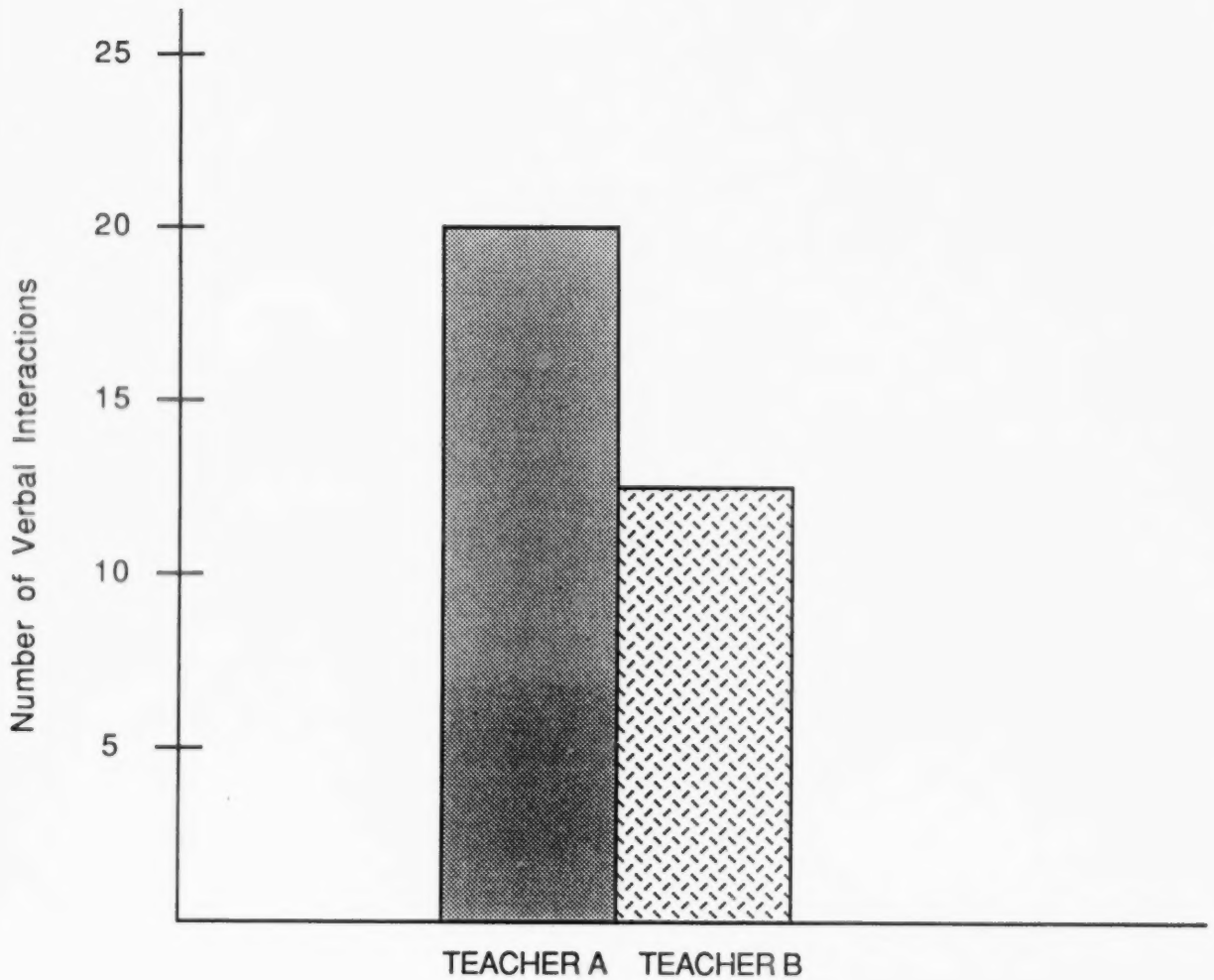
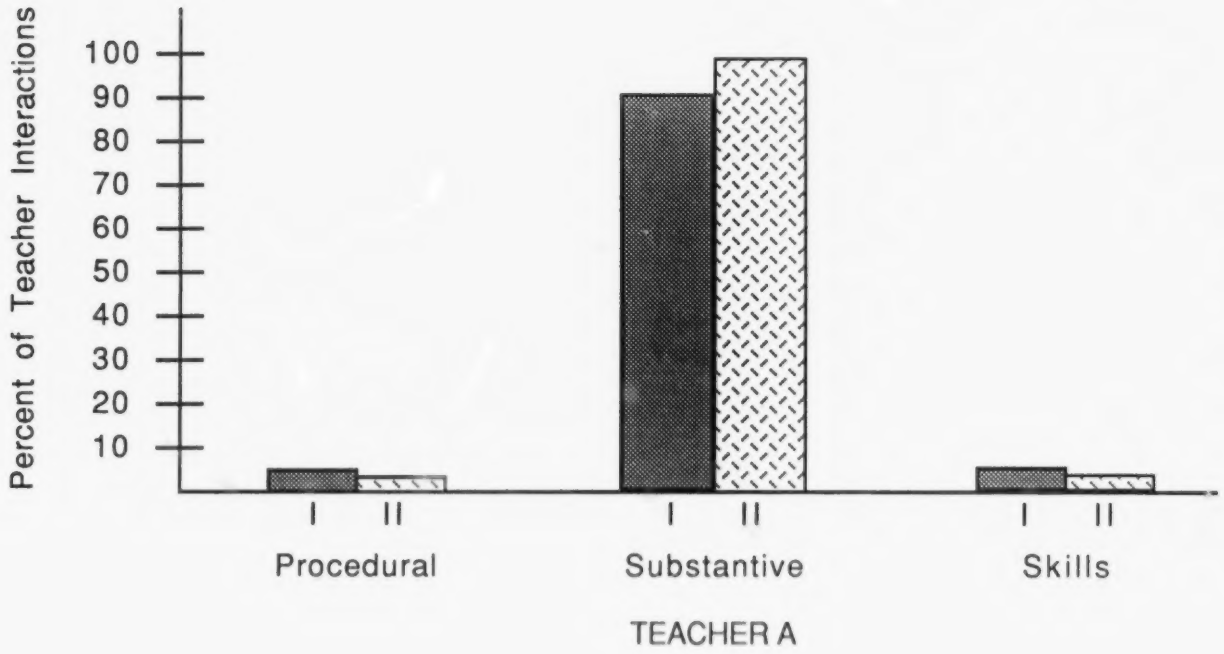
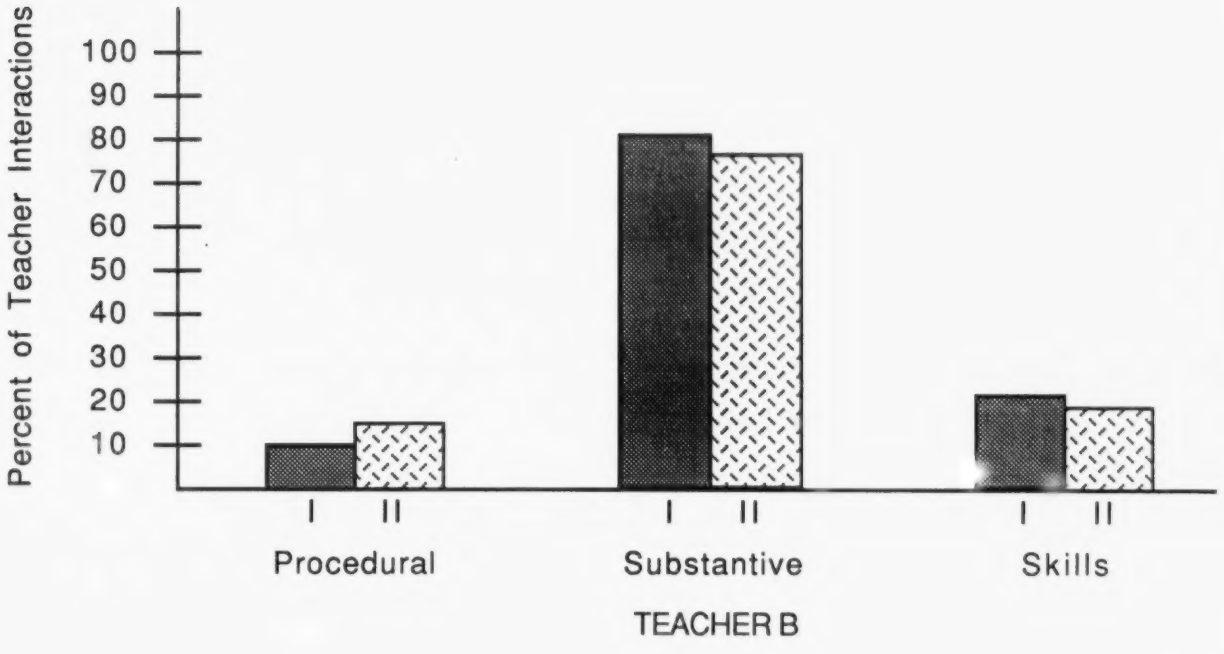


EXHIBIT 6

Instructional Approach
Year I vs. Year II





thus were fairly "procedural" in character. Students also wrote longer pieces of writing in the second year, which stimulated more editing discussions around their final drafts.

Though teachers were mainly substantive, they appear to have been more effective when they were procedural. Procedural interventions, together with the procedural writing activities, had a dramatic impact on students' productivity, sense of ownership of their writing, and even on the development of metacognitive awareness. The most consistent and important finding emerging from an analysis of all of our observations, across all of our classrooms and teachers is that although it is not the only useful approach, procedural instruction is a highly empowering approach for teaching learning disabled children to write.

The three case studies in the next section illustrate this major finding in detail. These rich case studies support our original research assumptions that close teacher participation in this research would be critical to its outcome. Participating teachers moved this research forward by illuminating the positive impact procedural instruction can have on students' writing.

Emerging from these stories of teachers and children working together is a model of writing instruction with learning disabled children that can guide future computer based writing instruction.

COMPUTERS

Another area of findings relates to the research question: <u>What are the unique features of word processors as writing tools for learning disabled children</u>? <u>How can these features support good writing instruction with LD students</u>? We explored these questions by identifying all of the ways word processing was used in writing over the two years, including observing students' reactions to word processor uses in the model writing activities. This section describes two unique features of the computer as a writing tool:

revision and interactive. We discuss how each set of features can contribute to a writing environment that includes procedural, su`bstantive, and direct writing instruction, we further describe what each approach can accomplish without the computer.

Revision Features

Current discussions of word processing for adults and children focus mainly on the revision features of word procesors. Functions--such as delete, insert, add, move, copy, wrap around--combine to make the process of changing text easier for children. We tend to assume that these revision features will have a strong impact on students' revision and editing processes. They may, but we find the most powerful impact of these features is on students' productivity. The fact that students can make any kinds of changes without having to rewrite the entire piece has a profound impact on their willingness to say everything they want to say in their writing.

Paul tends to write very little because his chronic spelling errors necessitate so many rewrites. His first story on the word processor was two pages long and he was so excited about the length that he kept tabulating the lines.

T: Turn your chairs around now so that I can tell you what we'll do next.

P: (Looking around from his computer with a stricken, betrayed look) Are we...do we have to rewrite this?

Several other voices echo anxiously: Have to rewrite? Rewrite?

T: Do you have to rewrite things you do on the computer?

P: No? (Momentary uncertainty)

T: No. All we do is make changes and the computer gives us a fresh copy. Isn't that why you wrote so much this time, Paul?

P: Yes! (Relieved)

For students who struggle daily to write, the rewriting process can be agonizing. As a result, students with serious writing problems keep their

texts as slim as they can get away with. Knowing that the computer will handle the rewriting encourages students to expand rather than limit their expression of ideas.

These revision features, together with the public interactive features, can support collaboration among students during composing and revision. To encourage substantive revisions of content, our core teachers paired students at the computer to review their drafts. The large upright monitor enabled them to read and comment easily on one another's texts. When the author decided on a change, he or she used the revision features to make the changes.

The revision features are particularly supportive of direct instruction focussed on editing skills. Students can learn a new punctuation rule and put it into use in text. The wrap around, insert, delete and movable text features also make possible some procedures for generating and organizing ideas on the computer that would require much rewriting with paper and pencil. For example, students can use an outlining procedure by typing in the outline then filling in text within the outline. They can use a procedure of writing the last "punch" line of a story first, then adding text "backwards." Equipped with Koala pad peripherals or integrated with a drawing tool (e.g., LogoWriter), the word processor can facilitate the use of graphic organizer procedures to help students generate and organize ideas for writing.

A pitfall of the revision features is that they may stimulate premature editing. Students with a history of writing problems are anxious to be correct. Chronic misspellers tend to stop to examine each word. If, on top of this, teachers are uncomfortable with seeing errors in print, students may not be able to focus on their ideas at all.

Several teachers felt the word processor stimulated them to ask too much of students in the way of neat and correct format and to ask it too early in the writing process. When children focus on spelling, mechanics, and correct word choice in the midst of forming their ideas, they tend to lose their train of thought. Because errors are even more glaring on the monitor than on paper, it is tempting to ask students to correct their text when they need to be expanding and discovering their ideas.

Interactive Features

The interactive features of word processing are probably the most critical and useful for teachers working with LD students. A number of word processor features combine to support close interaction between teacher and students and among students during word processing activities:

- The large print and the upright monitor make the text visible and accessible to others as its emerges.
- Carried out in a group setting, writing on a word processor is more public than handwriting.

Some of our teachers use these features to react to students' writing as an audience might during the writing process. In the example below, a fourth grade boy is writing about a trip as a small boy to a yearly family reunion in the South. The teacher walks by the monitor just as Evan is writing a story about how his grandmother's dog cured his asthma at their South Carolina reunion. "i took a place down there and when I was down there I was playing with dinamite."

T: Dynamite! (Exaggerated horror)

E: (Laughs) No! My grandmother's dog is named dynamite!"

T: Wheh! (Dramatically wipes her brow) Oh, I was worried. (Walks away)

E: (Turns to observer to confide) I'll tell her who's dynamite ...where it is.

O: Well, I was sitting here getting a little worried too.

E: (Next types 'who is my Nana's dog.')

The open, readability of his text enables the teacher to point indirectly to his ambiguous reference. As a result of that interaction, his text for that day read clearly.

DINAMITE

> Then in May I went to visit my nana and grand pa and aunt Kate and uncle Dan in South Carolina and I took a plane down there and when I was down there I was playing with dinamite who is my nana's dog and while I was playing with him and I had azma but I don't have it no more because the dog took it from me.

As the example above suggests, the public, interactive character of word processing can support a substantive approach to writing instruction. When a student has stopped writing, the teacher can see what the student has written and can use any number of specific techniques for helping generate a new train of thought. The teacher can, for example, easily prompt the child to expand the text by reading aloud what he or she has just written and asking a general question ("What else would you like to say?"), providing a specific direction for expansion ("Tell me more about his clothes"), or asking the child to clarify an ambiguous reference ("Are you talking about your father?") In the example below the child is prompted to add more text simply by hearing his own writing read aloud:

S: (types 'we are playing in the snow')

T: (reads his sentence aloud and as she finishes it, student adds 'the wet, slushy snow.'

The interactive features of the word processor enable the substantive teacher to observe and reinforce the child's content decisions, which would be less visible if the child were writing privately with paper and pencil. One teacher observed a student delete "deep red thick rugs" in a description of the Ritz and retype "red carpits." Because she could see the revision in process, the teacher stopped to read the sentence aloud and reinforce the child as a writer with "You can change it because you're the author."

The readability and accessibility of the LD child's text on the word processor is also a powerful advantage over paper and pencil during direct instruction, particularly in teaching spelling and mechanic skills. Both teacher and child can identify errors more readily, and the teacher can not only monitor but also praise the child's editing process.

Though a simple word processing program does not teach the child strategies or procedures, the interactive features can also support a procedural approach. Teachers can more easily observe when a child's writing process is breaking down, and therefore they have natural opportunities to remind the child of procedures used previously or provide the child a structure or procedure to help him continue. When the teacher watched the child above trying for several minutes to describe the inside of the Ritz tearoom, she suggested that the child stop and draw a paper and pencil map showing where the door, the dessert tray, the tea tables, etc. were all located. With this structure in hand, the girl was able to continue her description independently.

The interactional features create unique possiblities for collaboration, sharing, and assessing the child's progress. Yet the word processor also makes the child's writing more vulnerable to criticism and evaluation. If the substantive teacher has a strong agenda, children will have to work harder to maintain control over their writing. Our teachers reported that they tended to intervene more actively to make suggestions when a child was composing because the print was so visible.

In summary, a pencil is a private writing tool that the individual child uses to translate thoughts onto paper. Although a word processor also functions as an individual's writing tool, it creates a special kind of writing environment. It makes the individual's writing process more "permeable"--teachers can more easily see what strategy a child is using at any particular moment and when the strategy has broken down. Other people can read the child's writing at the same time that the child is reading or writing it, and can make suggestions or react with their own related ideas and experiences. The computer makes the writing process more visible by bringing into sharp relief processes that are less apparent with paper and pencil.

This kind of writing environment can transform the writing experience of the LD child, providing it is used to reinforce the child's self-image as author and to help the child acquire writing strategies and skills that help him be productive in the mainstream classroom.

Overall, teachers found that their LD students wrote more on the word processor, once they had acquired basic keyboarding skills. Teachers liked the status and equality that print gave their students, and valued the ease of collaboration that the writing machine promoted between teachers and students and among students. For students the writing machine represented freedom to make mistakes and change their minds without being penalized with rewriting. The computer, if it could speak, would simply say it is there to carry out whatever writing activities teachers and children choose as worthwhile.

The next section brings together word processing, teacher approach and the LD child's writing needs in three case studies. Together, they illustrate the potential of the computer in teaching writing, and particularly, in supporting a procedural approach.

IV. CASE STUDIES: TOWARD MORE PROCEDURAL INSTRUCTION WITH WORD PROCESSORS

This section addresses the third major research question: What is the impact of word processing on LD children's writing? The three case studies integrate data from student writing assessments, classroom observation, and students' writing products, to focus on the role procedural instruction can play in helping LD students during the early stage of the writing cycle when they are generating ideas for writing. Consistent with our earlier discussion, this section underscores the fact that substantive, procedural and direct instruction all have a place in teaching writing with computers. We find, however, across students with very different writing strengths and needs, that procedural instruction can be an especially effective approach across all phases of the writing process.

The case studies show students' responses to both substantive and procedural interactions with their teachers. In each case a substantive approach has limited results, while procedural teaching produces a strong impact on several important aspects of LD students' writing: productivity (number of words), their sense of ownership of the written product, and their metacognitive awareness of writing.

The three students' writing profiles presented earlier in Exhibit 3 are a composite of teacher ratings, EDC staff observations, and NAEP writing assessment results. They integrate sixteen cognitive, social/emotional, and motoric dimensions in order to represent a broad range of student writing strengths and needs. As Exhibit 3 clearly portrays, these students have highly different profiles reflecting the characteristic diversity of LD students' writing needs.

The case studies show how the child's computer use is influenced by both the teacher's approach and the child's special strengths and problems as an LD writer. In this way the case studies reflect the basic focus of the research, which is the intersection of the LD child, the teacher, and the computer.

Jeremy, the Chameleon: Impact of Procedures on Productivity

Writing Profile: At the beginning of his year in the project (1985-86) Jeremy was in the fourth grade and ten years old. He attends the high-income suburban school and has professional parents. Although Jeremy's general intellectual abilities are within normal range, they show up erratically in his writing. His writing profile at the beginning of the fourth grade (See Exhibit 3) was low in almost every area. Jeremy's anxiety about both his speech and writing were very apparent in writing sessions in the resource room. He was capable of sustained, normal oral expression, but he stammered and was incoherent when he felt on the spot to talk to the teacher or other students. Although his writing was sometimes original and funny, he usually had great difficulty committing himself to a writing topic and finding something to say. He often tried to distract others from writing by calling and making jokes from his computer; he suddenly jumped up or turned around in his chair.

His formal writing assessments and early writing activities during his year in the project pointed out four characteristics of his writing process that were symptomatic of his low confidence, anxiety, and problem with generating ideas. First, whenever he could Jeremy copied other students (thus the teacher privately called him "the chameleon"). The computer exacerbated this problem by making students' writing more easily visible. To counteract this, the teacher frequently placed herself between Jeremy and the other monitors.

Second, the more nervous Jeremey was, the more he deleted. This handwritten sample from our preproject writing assessment is typical of his crossing out and erasures (see Exhibit 7). Because he did so much erasing when he wrote by hand, Jeremy found the computer "awesome."

> You can rip the paper and with a computer you can't. By that I mean eraser. When I erase I sometimes rip my paper or make smudges and then throw it away and start over. But with the computer if you make a mistake you press the delete.

EXHIBIT 7

Jeremy - Pre-writing Assessment

1/11/86

Dear Mrs Teacher

throwing snowballs

I like throwing snowballs with my Dad and friends

I like getting hit with a snowball and throwing snowballs

Your friend

The teacher thought that the computer exacerbated Jeremy's deletion problem, by making rapid deletion so easy. On some days he deleted everything he wrote. He tended to hit the delete key whenever the teacher approached, so that she sometimes held his hands off the keyboard while talking to him.

Third, Jeremy's writing was highly repetitious. In the rock climbing sample, in Exhibit 8, for example, he repeated the idea of hard rock climbing five times. Similarly, during oral discussions of his writing he tended to loop back to one word or idea:

> See I was up on this high jungle gym and I fell off on my chin and blood was streaming out and my parents were away...real far away watching a race. Blood was streaming out and I was covered with blood and my lip got all bloody and my chin was like and blood was streaming out.

Finally, during writing activities Jeremy was highly dependent on the teacher to help him write, and complied with most teacher suggestions. "I don't know" was Jeremy's most frequent response to queries about what he will write. Given his distractibility and lack of easy access to memories and ideas, it was in fact probably true that Jeremy did not know what he knows.

Given these problems, the remedial teachers' specific goals for Jeremy's remedial writing work were that he:

- Demonstrate sustained attention through a writing activity.
- Write a story with a beginning, middle, and end.
- Write an expository piece with coherent content and well-organized structure.
- Improve his confidence in himself as a writer.

Response to Substantive Dialogue. Jeremy participated in the project in its second year, when his teachers piloted model writing activities designed by the EDC research staff. During the early weeks, conversations with the teacher were substantive dialogue aimed at eliciting what he knows. A typical dialogue took place as Jeremy was trying to think of a response to write to another student's story about learning to write.

Exhibit 8

Jeremy - Pre/writing Assessment: Free Writing

11/12/85

bikeriding
skiing
~~scubadiving~~
~~Rock climing~~

I like to go up hard rocks and see if I can make it I like trying rocks that are so hard to jump and going down ~~down~~ a ~~rock~~ across the street I like trying the hard ways to get up. I went up a hard wall that was 30 feet high I had hopes on me and it was hard

J: I can't think what I should write.

T: I'm sure you can find something...Think about...so Jana won't...and it'll make Jana feel good too. Right?

J: Yeah.

T: Maybe you want to tell her that you enjoyed the story.

J: Okay. (Does not write)

T: Maybe you want to tell her about something that happened to you in second grade and how you learned to write.

J: Oooh. (Mild interest. Slowly types 'Did you like to write in first grade' and stops).

T: Now what else?

J: I don't know.

T: Do you want to tell her if you liked to write in first grade?

J: I don't know if I did. I think I did but I don't know.

T: Well, maybe you want to tell her that.

J: Okay (Slowly types 'I did like to write' and stops).

Jeremy typically initiated these dialogues with "I don't know..." when called on to think and write, and the teacher typically responded by carrying much of the thinking and generating process for him:

T: All right (Reads what he has typed)
'She has to stop watching TV between 8:30 and 9:00.'
Every night? Most nights? All the time? Never?

J: All the time.

T: Okay, so would you put that in there. Maybe that would help me.

Jeremy produced very little text out of these substantive dialogues. The teacher felt that getting Jeremy to write in this way was "like pulling teeth." Jeremy sometimes did produce some text as a result of these labored conversations, but he wrote little, and had little interest in the result. Further, Jeremy turned the composing process over to the teacher as soon as he

floundered. These interactions perpetuate a cycle of "learned helplessness." The revision features of the computer did not help in this situation because they made it too easy for Jeremy to erase anything he wrote.

Response to Procedural Episodes. During some of the model writing activities we observed that Jeremy's typical "helpless" writing pattern shifted several times. Three isolated writing episodes offer glimpses of the specific links between a procedural teaching approach on the one hand and a more independent and productive student writing process on the other.

In the first episode, the teacher gave Jeremy's writing group a procedure for generating memories that they could write about. Students were to observe their thoughts as they closed their eyes and listened to questions like "Remember a time when you were sad;" "Remember a time when someone gave you something." In the group discussion following this procedure, Jeremy told a more sustained story than had appeared in any of his conversations in the writing group up to that point. In recounting being lost on a mountain, Jeremy clearly differentiated his own experience from that of his cousin who was with him and cried continuously through the crisis: "I loved it but my cousin was crying."

Jeremy had difficulty translating this successful oral storytelling into writing at that point. Nevertheless, the incident points up an important link between procedural instruction and social and emotional aspects of students' ability to express their own thoughts and ideas in writing. His ability to articulate his own separate experience was rare at that time for Jeremy, who tended only to echo other students' words, if he wrote at all. One aspect of Jeremy's negative self-image as a writer was his lack of confidence that he had something to say. His ability to differentiate himself and his experience from others is a critical prerequisite to developing that confidence. The opportunity to tell stories off the computer without the pressure to write may have been an important step in increasing Jeremy's confidence that he did have ideas to write about.

In a second episode the teacher gave students an interviewing strategy for gathering material for a report of students' television viewing behavior. As part of a "Reporter at Large" module, students were to write about one another's television viewing habits. The teacher demonstrated how students could interview their subject, take notes, and then use the notes as the basis for writing a rough draft paragraph. Exhibits 9 and 10 show Jeremy's interview notes and the subsequent paragraph. Although the notes reflect Jeremy's problems with legibility and spelling, the procedure helped him to gather sufficient information to write a first draft of the paragraph on his own, without teacher prompting.

In a third episode students used the computer to generate a list of tactile attributes of an everyday object to provide vocabulary for subsequent descriptive writing activities (described in Section II). The teacher had given each student a paper bag with an object inside and asked them to make a riddle about it by listing words that described how it felt to them. Students then exchanged computers and guessed each others' objects. The following day students brought in special objects of their own and created additional "riddles." The teacher gave students questions to ask themselves as they held their own personal objects hidden from each other in paper bags and typed descriptor words. "Talk to yourselves. Ask yourself, what does it feel like? What does it look like? Does it have a smell?" The teacher encouraged them to list all the attributes they could and then to use their attribute lists to write a description or story.

Jeremy actively participated in the first step of the activity, and after guessing others' riddles, he independently wrote a riddle:

> On the top it is black and on the bottem white and on
> the bottem it is buppe. mostly boys have them. some
> are alive they are different colors some are posiness.

On the following day the students were told they could write stories about their item. They could use their lists and could make their objects come alive if they wanted to. In what was highly atypical behavior for him, Jeremy typed independently for a half-hour and produced a substantial beginning for

EXHIBIT 9

Jeremy - Interview Notes

like some soapopers
The young and the rest
Wo it 1:30 4:00

No rules

watch is t.v. a 12'o clock when she is sick

NO court shows

has own t.v.

EXHIBIT 10

Jeremy - Write Up of Interview Notes

Lori likes to watch sopeoperes but not court shows has to stop beteen 8:30 & 9:00 she can watch T.V. at12 at night when she is sick she has her owen T.V.No rules for T.V.

his first independent story that year. Though he may have copied the idea of a capitalized title from the other students, his story kernel was entirely his own.

THE CASE OF THE MISSING SNAKE!

One day I was in the woods and I fonde a snake. So I took
it home it was black and white so I named it Blackie then
it said I like that name who are you said a snake I know
that what do you eat anything. Then my mom said go to bed.
when I woke up Blackie was gone!
and there was a note it said

The teacher's use of the memory, interviewing. and listing procedures helped Jeremy gain access to his own knowledge and imagination. As a result his final story draft was 124 words -- a miraculous amount of text for Jeremy (see Exhibit 11. That story illustrates the impact of guiding strategies on Jeremy's productivity.

The conversations that surrounded Jeremy's composing of the Case of the Missing Snake also suggest linkages between a procedural teaching approach and children's sense of ownership and metacognitive awareness, linkages that are described more fully in the two case studies that follow.

Halfway through the class period when the teacher saw Jeremy walk away from the computer, she stopped him with a typical substantive prompt:

T: We're not playing. Let's get over here. (Reads his last words) 'So I ran after him,' and you just ran and ran and never stopped running since...?

J: Yeah.

T: Come on, you ran after him and what happened?

J: I don't know.

T: What happened?

J: I'm thinking. (Echoing a phrase another student uses frequently when the teacher tries to intervene in his composing)

T: Did he get away? Did you catch him?

J: I'm thinking. (Teacher leaves to help someone else.)

EXHIBIT 11

Jeremy - The Case of the Missing Snake

2/7

The Case of the Missing Snake!

One day I was walking in my woods. I found a snake. I took it home. It was black and white. I named it Blackie. It said," I like that name." " Who are you?"I said. It replied "A snake." "I know that. What do you eat?"" Anything," it said."' I think I will put you in my fish tank but there is no fish there." Then my mom said go to bed.When I woke up Blackie was gone!
and there was a note it said
9 25 23 25 19 2 3 20 20 23
WHAT DOES that mean so I got out my code book.Then I know I think I will go get something to eat just then I heard a chres.
there was a man in the backyard he was wearing black. I ran after him.soon I was at a cave so I Flooed him in then I saw blackei and the man saw me I ran as fast as could but the leaped on I me then we fell into my samp I was trying to get the man of me just then I heard my Mom calling me" happy Birthday" she said it was all a dream here is your first present it was a snake that looked like blackei!

Jeremy usually surrendered ownership of the writing process to the teacher by acquiescing to the teacher's content prompts and suggestions. His resistance to the teacher's prompts was consistent with his unusual degree of investment in this piece of writing and new sense of ownership of the planning process. The episode suggests that as students begin to draw on their own knowledge and develop their plans they also begin to "own" the writing process and the emerging product.

This case also points up linkages between procedural instruction and metacognition. Essentially, having a procedure stimulated Jeremy to plan his writing. In observing and becoming aware of his own planfulness, he achieved metacognitive awareness. These linkages show up in two conversations.

First, Jeremey had typed independently through two writing sessions. He finally initiated a conversation with the teacher. Rather than asking the teacher to tell him what to write, however, Jeremy asked her to verify his plan and help him accomplish it. Specifically, he asked the teacher whether she could figure out the code he had devised in the mysterious note.

J: So now you know what that says (pointing to the string of code numbers on his monitor).

T: I'll figure it out while you keep on typing.

J: This one gives the first letter.

T: Of every word?

J: Yeah.

T: That's great! I'm so impressed! Did you know how to figure out this code when you read it? You knew what the code was about?

J: I knew I was going to do it like that. (Our emphasis)

Jeremy's "planfulness" represents a significant shift from Jeremy's typical helplessness.

A subsequent conversation points out a linkage between planfulness and metacognition. Jeremy initiated this one with his usual "I can't think of what to say," but he immediately went on to discuss how he might communicate

to the reader that his character who left the note in code is a spy. Although he did not have the terms he needed, Jeremy struggled to articulate an emerging distinction between what the writer knows and plans and what the character he created knows. Jeremy's awareness that he, as an author, could think about his own intentions and create intentions for his character is an example of metacognition.

J: Spy. He's a spy.

T: How do you know he's a spy?

J: Oh, I don't know from the story, I know how.

T: As Jeremy you know he's a spy.

J: Yeah.

T: But the kid in the story doesn't know.

J: Me in the story on the computer, I don't know. Here I do.

T: What did he do that's very suspicious?

J: I'm going to put that he wore black. His coat, it says that. I could say 'spy.' No, I don't want it to say 'spy.'

Jeremy's ability to plan his writing was a first step toward metacognition. His awareness that he was doing that planning <u>was</u> an expression of metacognition. As long as the focus was solely on the substance of writing, what he would say next, and next, planning was not taking place. In this case, the riddling and attribute listing procedures worked for Jeremy by helping him locate his own idea and generate a story plan. In actually observing himself carry out that planning, he at least momentarily achieved a level of metacognitive awareness.

<u>Impact on Written Products.</u> In her evaluation of Jeremy's progress during this year in terms of her four remedial goals, the teacher felt that he had made some, but not dramatic, progress. She saw him as more willing to complete a product and less obsessed with deleting. "He had a beginning of his story, he had a middle of his story, and he had an end.... That was something I never expected from Jeremy." She saw him as more willing to put his own ideas forward.

Those modest gains were also in evidence in Jeremy's fall and spring writing assessments, in greater productivity and in a more coherently written text. The number of words in his post-assessment sample of fantasy story writing increased by 200 percent and the number of mature words used in his story increased by 10 percent over his fall sample. His spring samples were written without the excessive erasures, deletions, and resulting incoherence of his prewriting samples. Jeremy's teacher expressed regret that she had played into Jeremy's "helplessness" so much of the year, and felt his gains would have been more substantial had she more consistently promoted his independence.

In summary, as long as Jeremy relied on others to tell him what to say, he produced very little writing. The computer exacerbated that "helpless" situation by giving him easy access to other students' ideas and enabling him to delete his own in an instant. When the teacher began to give Jeremy strategies for generating his own ideas, the computer became a more positive tool, reflecting back his ideas, stimulating him to write more, and reminding him of what he had accomplished.

Sam, the Artist: Impact of Procedures on Ownership

Writing Profile. At the beginning of his first year in the project (1984-85), Sam was ten years old and in fourth grade. He participated in the second year of the program as a fifth grader. He had repeated the first grade because of learning problems. Sam's parents are both professionals and are divorced and he attends the predominantly upper middle class school described in the sampling section. Standardized test scores and IEP records from the end of his third-grade year describe an intelligent and verbally creative child with moderate to severe organizational and behavior control problems. At the beginning of the fourth grade he was at grade level in mathematics and in reading comprehension and above grade level in vocabulary and spelling. WISC scores at the end of the third grade indicate a high I.Q. with considerable discrepancy between verbal and performance scores. He was highly distractable and had difficulty controlling his behavior during learning tasks of any length, although his self-control was improving at the beginning of the fourth grade.

Sam's writing profiles (see Exhibit 3) reflected his high verbal and creative abilities and low organization and attention. On the one hand he had strong oral and vocabulary skills, good sentence variety, and a moderately positive image of himself as a writer. Several teachers, beginning with his first grade teacher, had told him that he had a good imagination, and he perceived this in himself. Though they were frequently off-task and inappropriate in timing, his asides during class showed a keen ear for experiences and people around him. He said that he likes to write both at school and at home, and he "sometimes" thinks he is going to do a good job.

Sam revealed some of his talent for rich, original writing in occasional pieces and particularly in a description of a ride down Thunder Mountain at Disneyworld. He embedded vivid snapshots of the scenes that moved by him during the rapid descent.

> On My February school vacation I rode a lot of rides with my family at Disneyworld. My favorite ride was thunder mountin which you start in a mine shaftm then you start through a cavern at first it is dark then you see sclactts and sclagmites. Then all of a sudden your mining train goes out of control and when you come out of the cavern you are on a hi steap hill then you take off down the hill then you tear around a hairpin turn. After that you sprint past a chuck wagon caught in a flud with two men and a donkey one in a bathtub floting around and the other is baling out the wagon the donkey in whinnying Then you race around another hairpin turn and dart through a dinasor it was my favorite because

On the other hand distractability and attention problems interfered with writing fluently; extreme restlessness often resulted in semilegible writing. In class he had great difficulty focusing on a writing activity, although he was considerably more attentive on the computer than when writing with paper and pencil. His distraction resulted in a disorganized text. He lacked the concentration necessary to reread or correct mechanical errors.

His formal writing assessments and many of his writing activities during the first year reflect Sam's restlessness and distractability. Although two of his assessment samples were legible and grammatically clear, they were brief

and reflected little sustained attention to the writing. He was most restless during the third sample, which is semilegible because of misspellings and irregular letter formations. Teachers and researchers felt that these samples reflected his erratic behavior more than his real writing ability. (See Exhibits 12, 13, and 14.)

His teacher's goal at the beginning of fourth grade focused mainly on the formal aspects of Sam's writing:

- His cursive handwriting should be more controlled and better formed.
- Mechanics and ability to produce well-formed sentences should improve.

In his second year in the program, Sam's swings between immature, distracted behavior and mature, talented attention to writing persisted. He was on medication that year which moderated his behavior somewhat but left him highly restless when it wore off. His teacher's goals at the beginning of fifth grade were to:

- Improve his ability to manage his behavior during writing and attend to a writing activity from beginning to end.
- Show more sustained expression of his creative and original ideas in writing.
- Increase his mastery of mechanics and editing skills.

Response to Substantive Dialogue. In contrast with Jeremy, Sam did not initiate collaborative writing conversations. He needed to control his own writing process. As a result his interactions with his primarily substantive teacher were sometimes strained. When his writing was underway he viewed teacher prompts as a threat to his control and resisted them diplomatically, with vague answers or acceptable humor. When the teacher asked Sam whether he saw her note on a first draft paragraph about sports ("Sam, I'd like to know more about what you mean by peace and quiet when you're skin diving"), he identified the content as her interest rather than his: "You want to know about the peace and quiet." "So I'm supposed to tell you what the animals looked like and stuff?" When the teacher persisted with, "Well, what animals do you want to tell your readers about?" he quipped, "It's hard to know unless you take a waterproof book full of fishes with you."

EXHIBIT 12

Sam - Pre/writing Assessment: Fireflies

Here is a picture of a girl who is having fun in the summer. Look at the picture for a while. What do you think she is doing? What do you think she might do next?

Write a story that tells what the picture is about.

She is gonna to catch a fire fly a lotal big with lite on his tail fire fly only come out at night.

They are not related to the (roaches) House fly.

EXHIBIT 13

Sam - Pre/writing Assessment: Puppy Letter

"Puppy Letter" Exercise

Pretend that your family is moving to a new apartment. The landlord has refused to let your puppy live there. Write the landlord a letter, trying to convince him to let you keep your puppy in the new apartment.

Space is provided below and on the next two pages. Sign your letter "Chris Smith."

240 West Street
Bigtown, Pennsylvania
September 15, 1984

Dear Mr. James,

My puppy is very neat
He loves people and
I'm sure you will agree
If you would let the live here for a week
You will see you will like him
Yours truly,
Chris Smith.

EXHIBIT 14

Sam - Pre/writing Assessment: Goldfish

"Goldfish" Exercise

Sometimes it is fun to think about what it would be like to be something besides a person. What would it like to be a goldfish? Or an airplane? Or a horse? Or a tree? Or any other thing?

Think about what you would like to be. Write the name of the thing in the box below. Then write about what it is like to be that thing. Space is provided below and on the next two pages.

PILLOW

If I wer a Pillow
I becuse he is lea all day
and somebody put their head
on me and somebody
would fight, squese me and
sleep on me and they
jump on me wash me
& every bed like a
Pillow.

66

Given the choice, Sam clearly chose to work on his own. His independent composing style occasionally created quiet struggles for control, given the teacher's equally strong commitment to helping him structure his composing process. It happened, for example, while Sam was composing "Thunder Mountain." When Sam mentions the "split second" on top of the mountain before beginning the descent the teacher suggested he include that in the description:

T: (Walks by Sam's monitor and reads his text) Boy, you described that nicely, Sam.

S: You only have split second to look.

T: Are you going to talk (write) about the split second?

S: No.

T: Are you going to?

S: No.

T: How come? Are you going to tell about that?

Sam continued to resist her suggestions for several minutes until the teacher finally relinquished the choice to him: "All right, if you're pleased about the way it is, you can leave it. I was just thinking that--you said you were there for just a split second--okay."

Substantive writing process worked for Sam when it served his own plans as a writer. Following the exchange above he initiated a substantive dialogue with the teacher, asking her to help him think of an appropriate word to express his idea. Having established that he was in charge of the composing, he used the teacher's help to move his own plans along:

S: How could you describe going real fast like (makes noise)?

T: Okay, in other words, the way you were describing that to me, you had your hand go up like this and then you made a sharp

S: (Makes sound.)

T: In other words, you want to maybe think of a word that would describe going fast?

S: Yeah.

T: What about racing?

They discussed what would b^ a word that would describe going fast, then the teacher got a dictionary to look up synonyms.

S: Um, I kind of like 'tear.'

T: That really does give the feeling of going very very, fast.

Sam types 'tear around a hairpin turn'.

Although their conversation resembled the earlier, teacher-driven dialogue, it has changed significantly in placing Sam clearly in the author role. He essentially "trained" the teacher to assist him rather than imposing her content agenda.

Response to Procedural Episodes. Some of the teacher's most effective interventions with Sam were procedural, because they provided him the sense of ownership he needed in his writing. Sam's response to isolated procedural episodes focused his attention long enough to produce some writing. The "Thunder Mountain" story was stimulated by a story frame with a set of guiding questions. After answering two of the questions ("Where did you go on your vacation?" "What was your favorite part?") Sam continued with his story, pushing the remainder of the frame out of the way, ahead of the text.

Similarly, the teacher's use of tactile riddle activities described above focused Sam's attention on a specific object--a toy hippopotamus. After generating a list of its attributes, his own imagination and creative talent took over and he wrote a humorous dialogue between Harry Hippo and P.J. Python in Monty Python style. Having found an idea, he wrote in a sustained and concentrated way over several writing sessions.

Impact on Written Products. As with Jeremy, we don't know what the impact of a more balanced instructional approach would be for Sam. Sam's Year II teacher felt that his writing had improved by the end of that year more than his pre- and post-project writing samples would indicate. Post project writing samples were shorter, and in two cases, of lower quality than the pre-project writing samples. Year II aspects of Sam's writing showed improvement. The ghost story written at the end of the year had a 20 percent increase in the number of mature vocabulary words used. Further, Sam's

general attitude during the post project writing samples was consistently more relaxed and focused than during the earlier writing samples. His teacher felt that Sam did not respond well to the assessment conditions, which required him to write on an assigned topic.

Sam's teacher felt that despite his erratic emotional states, Sam's self-image as a writer was strengthened by the writing that he successfully completed.

> He knew he was good. He knew he was funny. He knew he could keep your interest, but he also knew that he wasn't going to be able to do it all the time. But he made up for it on the times when he could. No question but that he sees himself as a writer. He knew it long before we pointed it out to him and he just ate it up when we did.

In summary, both substantive and procedural approaches can contribute to a child's writing process at the computer. Sam's profile helps illustrate the point, however, that unless the substantive, collaborative dialogue takes place within the context of the child's own plans and intentions it will tend to be the teacher's ideas and directions that drive the conversation. Less confident, more compliant students like Jeremy, who do not have a plan and lack any skill or confidence toward having one, will at least seem to participate and will sometimes include the resulting content in their writing. More autonomous, self-confident writers like Sam will actively resist this form of collaboration unless it supports their goals and intentions. The strength of the procedural approach for Sam lies in providing him with strategies for carrying out his own planning and composing. Because he is discovering what he wants to say, he maintains the powerful sense of ownership he needs to foster his self-image as a talented writer.

The computer assists Sam by reflecting back ideas to him and thus reinforcing his pride and ownership in his writing. The accessibility of Sam's text on the monitor is helpful, as long as Sam is able to be in the "author" role and control the content and direction of the writing.

Evan, "Getting" Writing: Impact of Procedures on Metacognition and Self-Image

Writing Profile. At the beginning of his one year in the project (1984-85) Evan was in the fourth grade and 10 years, 6 months old. He is Black and has been bused from Boston to a nearby city since kindergarten. His family is hardworking, his mother a respiratory therapist. He repeated kindergarten, because of very low readiness for school, developmental delay, and high anxiety about school. He has spent five hours per week in the resource room since kindergarten, and in the fourth grade he was in the resource room specifically for assistance in reading, computation, and writing. At the beginning of fourth grade Evan was close to grade level in reading comprehension, and a year behind in vocabulary, spelling, and math. During his earlier grades Evan's immature language and oral skills combined with aggressiveness made peer interactions difficult. This showed up particularly in the previous year in a class of particularly articulate, verbal boys who could "talk circles around him."

Evan's writing profile at the beginning of the fourth grade (see Exhibit 3) was that of a boy with stronger oral skills than written language skills. Although he tended not to talk in complete sentences he was a loquacious storyteller who talked exuberantly about his friends and his life. Many of his stories were about his extended family, particularly nephews and nieces for whom he helped care. He read poetry aloud with a dramatic sense of feeling, particularly when it was set to music.

His writing was legible, both because his letters were well formed and he spelled fairly well, and he reported that he enjoys writing at home and at school "a lot." While he could write briefly about something concrete and immediate he usually could not elaborate, and his narrative was frequently disorganized, if not incoherent. His resource room teacher, who had worked with him since kindergarten, felt he just began to catch on to reading the previous year and didn't yet get writing. "His sequencing is funny, he doesn't know what sort of information he has to tell the reader and what you don't....He doesn't know to be specific."

During his three formal writing assessment activities, he wrote slowly and deliberately and appeared fairly relaxed and focused (see Exhibits 15, 16 and 17). "Puppy Letter" indicates some grasp of the persuasive letter genre. For "Firefly" he wrote a single descriptive sentence without further story development. He had not grasped the requirement of "Goldfish" that he write what it would be like to be a leopard; he used a simpler strategy of comparing himself with a leopard ("They fast so do I"). Though brief, the responses expressed some personal force ("If you do I would do anything for you;" "they fast so do I and a leperit is my favorit animal").

At the structural and grammatical levels, he used a variety of complex sentence structures with relative, conditional and causal subordinate clauses ("I wish I could;" "If you do I would"; "I would like to be a lepert because"). Some irregular syntax ("because they fast"), omitted words ("like to be a leperit"), lack of parallel structure ("they fast so do I"), unclear meaning ("reaching for a leaf for a fireflies"), and "run on" sentences, lacking punctuation and capitalization, together contributed to a lack of coherence in two of the exercises.

Although his productivity was erratic during the early fall, Evan produced many more words in some activities than he did in the independent writing assessments. His teacher thought that this greater productivity was related to opportunities to talk about his stories before writing and finding a subject important enough to him to warrant the effort of writing.

The remedial teachers' major goals for Evan were that he:

- Write a coherent story about a sequence of familiar concrete events. He should be able to write a coherent beginning, middle, and end.
- Exercise this storywriting on his own, without continual teacher intervention.
- Develop greater confidence in his ability to express himself in writing.

Response to Substantive Dialogues. Evan's resource room teacher worked with him on writing at least four days a week for approximately 45 minutes in the resource room. Some of their work such as a book report and an autobiography,

Exhibit 15

Evan - Pre/writing Assessment: Fireflies

Here is a picture of a girl who is having fun in the summer. Look at the picture for a while. What do you think she is doing? What do you think she might do next?

Write a story that tells what the picture is about. The girl is reching for a leaf for a fireflies.

Exhibit 16

Evan - Pre/writing Assessment: Puppy Letter

"Puppy Letter" Exercise

Pretend that your family is moving to a new apartment. The landlord has refused to let your puppy live there. Write the landlord a letter, trying to convince him to let you keep your puppy in the new apartment.

Space is provided below and on the next two pages. Sign your letter "Chris Smith."

240 West Street
Bigtown, Pennsylvania
September 15, 1984

Dear Mr. James,

I wish I could keep my puppy in the house if you do I would do anything for you.

from Chris smith

Exhibit 17

Evan - Pre/writing Assessment: Goldfish

"Goldfish" Exercise

Sometimes it is fun to think about what it would be like to be something besides a person. What would it like to be a goldfish? Or an airplane? Or a horse? Or a tree? Or any other thing?

Think about what you would like to be. Write the name of the thing in the box below. Then write about what it is like to be that thing. Space is provided below and on the next two pages.

LEperit

I would like to be Leperit because they fast so do I and a leperit is my favorit animal.

74

focused on assignments Evan had difficulty with in his mainstream classroom and were designed in collaboration with the classroom teacher. The resource room teacher also had considerable leeway to tailor additional writing activities to Evan's needs.

The teacher's greatest concern during the fall months was helping Evan find topics that he really wanted to write about, and to generate a coherent set of ideas once he had chosen a topic. During this period she frequently used a substantive approach to draw out information, asking a series of questions to elicit his memories and ideas. In one such session they talked together in this way for close to 45 minutes, touching on many topics in his "topic list" including his family's reunions in the South, where his father usually joins them. Despite the personal importance of these life events Evan responded lethargically to her string of questions. This kind of exchange usually culminated in discouragement.

T: What are you an expert on?

E: Running (a topic on his list). But not on thinking.

T: You're not an expert on thinking?

E: Sometimes (low voice).

The teacher herself found this kind of dialogue a gruelling war to help Evan get in touch with his idea.

In a subsequent writing the teacher began with a substantive approach, then shifted to a procedural one. She used a substantive approach over several weeks, patiently drawing out a story about experiences about roller-skating, one of Evan's most loved activities. Exhibit 18 is a handwritten draft from those weeks that reflects several episodes of their collaborative composing process. Evan and the teacher each wrote some of the draft in the following sequence. In response to many teacher questions Evan first wrote a brief description of his experience of <u>time</u> at the roller skating rink.

> Soon as I get in and I go get my skates and then I go on the floor. First he start out with slow micis and noone is realy there. then when it is giting later by the minit but it is slow because your rollerskating. (See (a) in Exhibit 18).

Exhibit 18

Evan - Collaborative Roller Skating Draft

chapter 2- Getting Ready to Skate

(a) Soon as I get in and I go get my skates and then I go on the floor. But he start of with slow mids and no one is ready there then we it is going later by the minute It seems ~~but it is going~~ because your roller skating XX I just love to go fast when they call men only we make trains and go fast as we want and we go flying around the corner but the roller skates hurt your feet to the skate like to and I go and get a drink of water and I just sit there while the rest go by my face then I go back on the rink

it makes. you get blisters

(b)

everyone starts coming in

XX But time is going by slow.

And every time I ~~go around and around time is going by fast.~~ it is seven stop and think thin I go look outside ~~then I go back on the floor~~ and it is still early. Then I go back on the floor

(Go back to middle)

The teacher encouraged him to talk about what he means about "when it is geting later by the minit but it is slow" and encouraged him to type more. She showed him a way to mark (XX) the place in his draft where he was adding new material (see b in Exhibit 18). His addition then read:

> Everyone starts coming in but time is going by slow. And. everytime you go around and around time I is going by fast. stop and think thin I go look side then I go back on the floor.

Their next conversation resulted in some revisions by Evan and some in the teacher's writing, to make the subtle point that one's sense of time is distorted in the fast moving rink, so that it seems later than it really is. Their next collaborative draft of this section read:

> Soon as I get in and I go get my skates and then I go on the floor. frist he start out with slow micis and noone is realy there. then when it is geting later by the minit it seems like time is going fast because your roller skateing. Everyone starts coming in. But time is going by slow. And everytime I go around and around I stop and think it is seven thin I go look outside and it is still early. Then I go back on the floor.

This patient collaborative approach gradually produced an acceptable draft, but the teacher found it laborious, requiring extensive amounts of her time. This seemed the only approach at the time, however. Left on his own, Evan either wrote little or produced very disorganized material.

Response to Procedural Instruction. Parallel to the kind of collaborative writing sessions illustrated above, the teacher began to experiment with giving Evan procedures to use in generating ideas and writing more independently of her. She had him list in handwriting everything he remembered about the skating rink (Exhibit 19) and then use the list to remind him of things he wanted to write. She also had him type three "starter" prompts onto the word processor: "I see...I hear...I smell." The computer's wrap around feature supported this strategy--each starter prompt moves aside to accommodate as much text as he wants to enter.

Exhibit 19

Evan - List of Roller Skating Details

details

hotdogs
people falling
bumping
flashing light
snack bar
ticket booth
skating ring
viedo games
skates $ tane
water founten
people rollerskating
people bumping
rest rooms
chairs
lockers
people playing
people talking
people giting skates
misic
fansc skating

Exhibit 20 is the result of that structure. Evan composed that draft without the question/answer process that had laboriously generated several paragraphs over many previous weeks. The day after he wrote the I hear/smell/see material, the teacher suggested that Evan expand the part about playing in the middle. Praising what he has written in the "I see" section, she prompted him through what was for them an unusually brief rehearsal:

T: This is what I wanted to say to you. You really caught my eye here. (Reads aloud) 'I see the people skating. I see the floor guard. He spins he skates backward and he criss crosses his feet. I see a little boy holding on to the pole. Sometimes he falls. I see all my friends. Jerry is roller skating fast and playing in the middle.' You know what would be helpful? I want to know more about playing in the middle. What does that mean, we play in the middle?

E: Like we play tag in the middle?

T: Why can you do that in the middle? Why are you in the middle and not on the edge?

E: Well, like if you play on the edge, like, you'll probably make somebody fall.

T: So what do you do? You know what I'd like you to think about? I'd like you to think about the playing in the middle part. Now do you remember how to move the cursor down?

Evan then types a new section, entirely on his own, about skating in the middle of the rink. Because Evan generated the details, and they were held within a clear organization, the teacher's prompt facilitated expansion without impinging on Evan's ownership of the composing process or content.

Another procedural activity further illustrates the linkage we saw in Jeremy's case study between procedural instruction and metacognition. In this activity the teacher provided Evan with a set of procedures for prewriting, composing and revising an autobiography for his mainstream classroom. The resource room teacher took on this project with Evan when he became overwhelmed with the task of writing about his whole life. First he brought stories about himself to their resource room sessions. He asked his mother to tell him stories, and she pointed out information in his baby book. Then he did what he does most

EXHIBIT 20

Evan - Independent Roller Skating Draft

I hear Fast Music Conversaytions and the skates Sounds like Thounder.

I smell the pizza in the snack bar. and french fries. too.

I see people skating. I see the floor guard dancing all fancy. He spins. he skates backwards and he criss-crosses his feet. I see a little boy holding on to the pole. Sometimes he falls. I see all my friends. Jerrry is rollerskating fast as we plal in the Middle.

9:46

easily and successfully--told the teacher stories about himself. The teacher indexed each story on a 3X5 card, with his age on one side and a brief reference to the story ("Put talcum powder on the dog") on the reverse side.

Over many days the pile of cards grew, until Evan had stories about his infancy up through the present. Then the teacher had him sort the cards by age and set the "rule" that each time he went to the computer to compose his autobiography, he could take just two cards with him. Whereas his earlier roller-skating story was written mostly by hand and then transcribed onto the computer, he composed all of his autobiography on the computer using this system. He showed that he had internalized this system by describing it to the observer:

T: What do I want you to do?

E: Make some corrections, right?

T: No, I think you're still writing, so get your cursor down to the bottom of the page and we can get our system going again with the cards.

T: (To the observer) I thought we could explain his system to you. It's a very complicated system (complimentary tone). He's writing his autobiography. Can you touch these yet? (pointing to the large stack of cards in a rubber band).

E: Nope! Not til I'm finished with these right here. Can I explain this? (to the teacher) Well (to the observer) first I already did these two here (points to two pink index cards).

O: Those are two questions about when you were five months? (Reads "how old when I rolled over.")

E: Yeah (reads) How old was when I rolled over. Pulled myself up. I already did these two right here.

O: Did you ask your mother?

E: Yeah. I got most of the questions from my baby book. I'm all finished with this right here. And now I'm on this (indicates two other cards).

O: And you're using these to write some paragraphs about yourself?

E: Yeah. Like this right there, is like a story. (Points to two cards)

5 mos
plane to visit
G'me and G'pa
Aune Kate and Uncle Dan in South Carolina

5 mos
first talked 5 months
said "Da Da"

O: Something happened there I bet

E: Yeah. We went on a picnic. First we stayed there for a while, and a couple days later we went on a picnic (reads other card). This is going to come before this (pointing to each card in sequence).

His ability to articulate the strategy procedure showed the extent to which he had, internalized the system initially provided by the teacher. In contrast with his earlier discouragment about his ability to think, he can now observe himself thinking about his writing -- the essence of metacognitive awareness in writing.

Evan's excitement about writing toward the end of the year points up a final linkage between procedural knowledge, productivity, ownership, metacognition, and a positive writer self-image. He communicated his excitement about this writing in the way he later said goodbye to the observer. The observer had just read one of his stories from the monitor, and Evan told another story about pulling a jar of powder over himself and getting so white that "My mother thought I was dead."

T: (From the writing table) Wait til he tells you the story about the talcum powder!

O: He just did.

E: It's coming up (referring to the stack of cards)

O: That's on the cards?

E: That's going to be the funniest part.

O: I hope you get to that today...but it looks like you have a lot to write about today.

E: (Eagerly) Are you going to be here tomorrow?

O: Are you going to be writing about it tomorrow?

E: Yeah, I'm going to write about it every day (proud). I hope. (Starts composing)

Evan's sense of ownership of his substantial autobiography and his new view of himself as a thinker, made him proud of himself. They were the basis of his image of himself as a writer.

Impact on Written Products. Without a more controlled study we cannot directly attribute pre- and post-assessment changes in Evan's writing to the teacher's increasingly procedural approach to instruction. While the other students' written products reflected somewhat "ambivalent" instructional contexts, however, Evan's writing can be viewed as the product of over five months of procedural instruction.

Evan's teacher perceived his writing year as successful in terms of her three remedial goals. The routines and systems helped him generate meaningful story topics and generate coherent event sequences. With the autobiography, particularly, he had clearly internalized their system for generating one story at a time. At the metacognitive level he could talk explicitly about the procedure he used to manage the writing. Finally, because he recognized the value not only of the stories but also of his ability to talk about and manage his own writing process, his confidence and self-image as a writer expanded substantially over the year.

Evan's post project writing assessment does show improvement in his productivity and writing quality. The second "Fireflies" is over twice the length of the first assessment. Although he did not write a story, his description communicated very clearly a meaning he may have intended in his first incoherent attempt.

(Pre) The girl is reching for a leaf for a fireflies.

(Post) The little girl is reaching for a firefly on a leaf.
But the leaf is to high for the little girl to reach.

His persuasive letter in the post project assessment is 30 percent longer than the pre-assessment letter. The striking difference between the two is the greater maturity of the argument in the second letter. The pre-assessment letter is a personal appeal, without specific reasons.

(Pre) Dear Mr. James,

I wish I could keep my puppy in the hour is you do I would do anything for you.
fron chris snith

In contrast, the post assessment one presents both his own and his parents' viewpoints with a specific argument for each position.

(Post) Dear aunt May,

I'm big enough to make this trip and I'll was (watch) out for and all that. My mom and dad don't want (me) down there with you. My dad thinks I mite get lost.
Love Jeremy

While Evan's products showed improvement in overall quality, the most dramatic change was in his sense of confidence that he had a repertoire of "writer's" strategies to help him manage the complex demands of writing assignments in both remedial and mainstream settings.

In summary, Evan moves from being able to write very little and from a view that he <u>can't</u> think or write, to an "autobiography." While the teacher's substantive approach probably helped Evan get started, her gradual shift to a more procedural approach gave Evan with the tools he needed to be able to manage a complex, fourth grade writing task on his own. The computer fostered his progress by reflecting back his written stories, stimulating him to write more, flexibly incorporating new stories from his memory or card file and eventually enabling him to punctuate the long draft of stories.

In another conversation with the observer Evan reveals how integrated the computer is into his writer image. He held up a picture, from a classroom computer magazine of a child writing at the computer with two beaming adults looking on, "See," he said, "that Miss L___ (pointing to one adult) and that's you (pointing to the observer) and .... that's me!" (pointing to the child).

Together, the three case studies highlight different kinds of impact that procedural instruction can have on writing. Though the boys had very different writing needs, they became more energized and involved writers when they had procedures, or strategies for generating ideas on their own.

TOWARD A MODEL OF PROCEDURAL WRITING INSTRUCTION

The special strength of case studies lies in actually showing the linkages between critical teaching and learning variables. Thus the real intent of our close analyses of the three children is to contribute to the theory of writing instruction.

Two models actually emerged from our case study analyses. One, shown in Exhibit 21, is an overview of the role each of three basic instructional approaches can play in writing instruction with LD children. The model connects the teachers' instructional approach with the kinds of knowledge children need for writing, and the general cycle of writing activity. Procedural instruction is critical throughout the writing cycle, because it provides the child with knowledge of how to plan, compose, review, edit and even publish their writing. Substantive instruction is useful early in the writing cycle for an extremely reluctant writer and during writing once the child's own planning processes are underway. Direct instruction is most facilitative at the end of the cycle when the child has freely communicated his or her idea and can focus on shaping the writing product in terms of "tenets" of good writing and formal rules of editing.

The second model in Exhibit 22 portrays the specific linkages between procedural instruction and important student outcomes. There linkages emerged from our case analysis and were presented in Jeremy's, Sam's and Evan's cases. The model begins with the point at which students have a writing task. Because writing is always an act of inquiry, we can think of it as a "call to think." Students respond differently to that call, depending on their ability to bring planning, composing, and reviewing procedures to their writing process.

EXHIBIT 21

Timing of Instructional Approaches with LD Writers

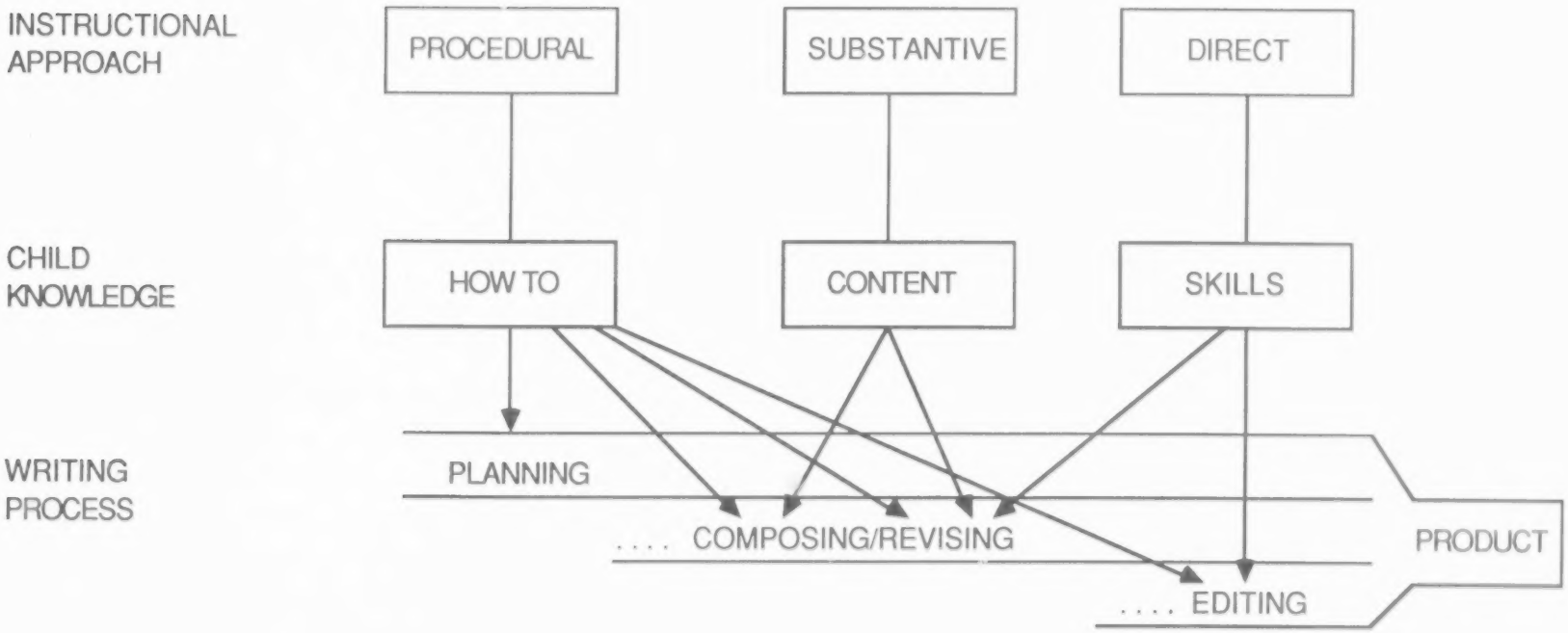
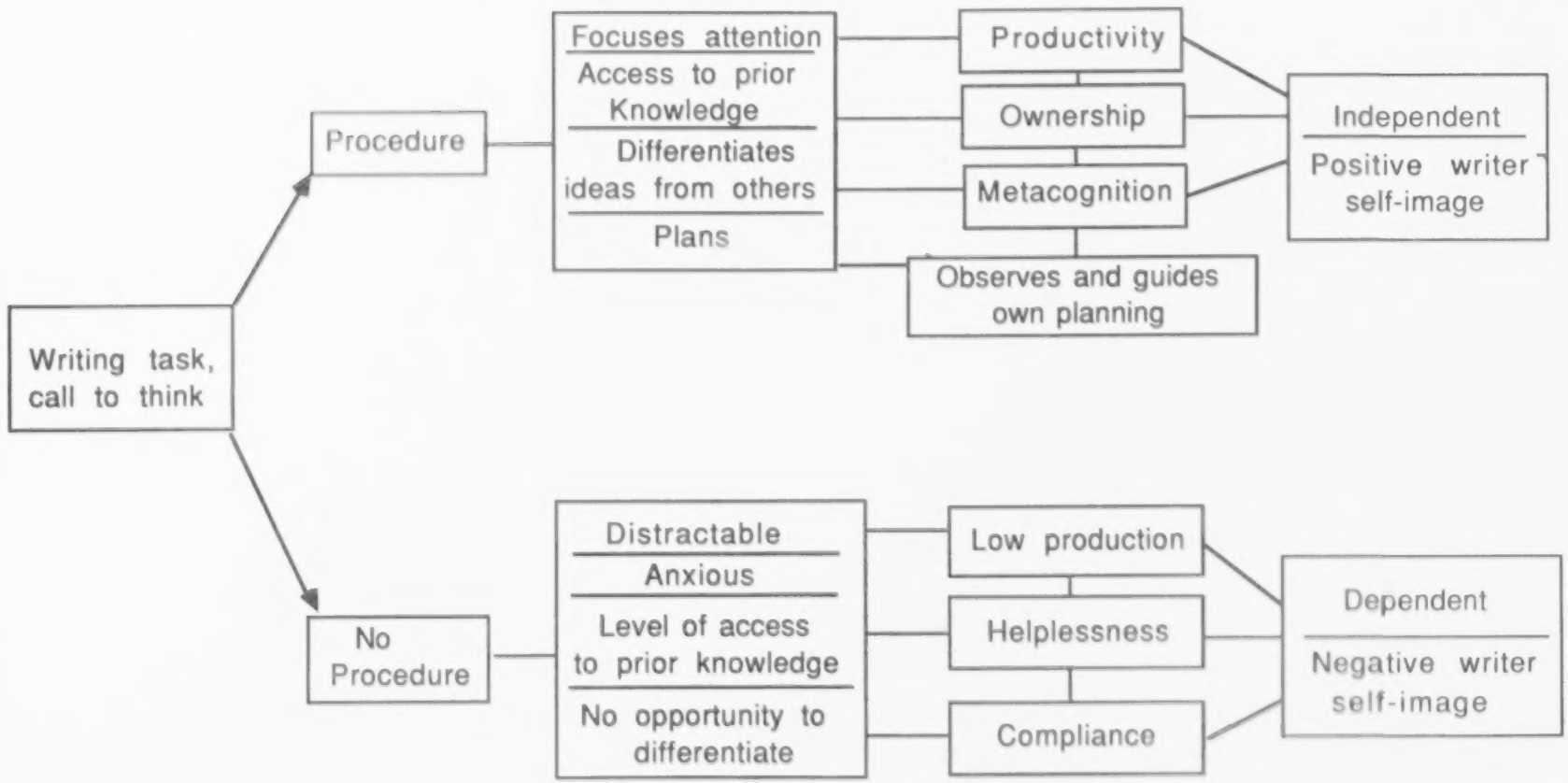


EXHIBIT 22

Role of Procedural Knowledge in Productivity, Ownership, and Metacognition



The bottom section of the model represents the writing experience of students who are unable to draw on procedural knowledge when called to think about a writing task. Without a planning procedure the children are distractible and prone to anxiety; both those states block their access to their own substantive knowledge. Their inability to generate ideas means they write very little, and it leads to a sense of helplessness and vulnerability to others' suggestions for what to write. The content of the students' writing will be less what they generate and integrate themselves than an echo of others' ideas.

Cumulative experience of complying with other's ideas leads students to a lack of ownership of the writing process and a negative image of themselves as writers. Because they lack knowledge of how to go about the writing process, each new writing task arouses the same pattern of anxiety and helplessness. Writing is a dead-end process rather than a gradual development of communication abilities.

The top section of the model portrays the writing cycle of students with procedural knowledge of writing. A procedure focuses students' attention on the task, gives them access to what they already know, and makes them aware that they have knowledge and ideas separate from those of other people. A procedure or routine gives the student ways to integrate new information into the content of their writing.

As children remember what they know and generate ideas, they produce text and begin to "own" the writing as their own communication. They notice and think about their own thinking and planning, and they achieve metacognitive awareness. When they begin to think about, choose, and manage their own writing, they have achieved some ability to carry out the complex task of writing independently. Finally, when students see that they can generate ideas and manage their writing process, they begin to acquire a positive image of themselves as writers.

We represent the top section of the model as a cycle, since each increment in productivity, ownership, and metacognitive awareness gives students more ability to call on planning procedures with each new "call to think" and write.

This model may help to fill a gap in current writing theory as it relates to learning disabled children. Cognitive processing models such as that of Flower and Hayes (1981b) powerfully outline the planning, composing, and reviewing processes adults use in writing. We have not known exactly how such models apply to children. More important for this study, we have needed a way to understand how the basic writing process breaks down for LD students, and the kinds of interventions that could support them. The model above contributes a notion that children need several kinds of knowledge in order to carry out the writing process: they need substantive knowledge (ideas, content, information), procedural knowledge (ways to manage and carry out planning, organizing, composing, revising, editing), and skills (rules/conventions for correct mechanisms). Despite great variation in their particular writing strengths and needs, LD students share the dilemma that they have a great deal of knowledge and experience to draw on, but have difficulty accessing, organizing, and transcribing it. Thus, for LD students to participate in school learning, the acquisition of procedural knowledge is enormously important. For teachers, balancing substantive and direct instruction with procedural instruction is critical to empowering these LD writers.

V. SUGGESTIONS TO TEACHERS

This study of word processing has been primarily a study of teaching -- how teachers integrate word processing into good writing instruction. This focus on instruction came about for two reasons. First, word processors are essentially tools and as such they become an extension of the philosophies and assumptions of the teachers who use them. In studying word processing we are lead inevitably to look at the instructional approaches of the teachers who use them. Second, classrooms that use word processing seem to particularly illuminate the teacher's role for the observer. In making the students' writing process more open and visible, the computers in these resource rooms also made the teachers' styles and interventions more accessible to view.

A "substantive" teacher in a paper and pencil environment might initiate occasional conferences with a child about his writing in which they pause and sit down together to look at the writing. In the presence of a computer that same teacher spontaneously enters into the child's ongoing writing process, as the text appears on the screen. Similarly, teachers' procedural interventions are more visible because the observer can also see the text or the breakdown that prompts the teacher to help the child rediscover how to manage that part of the writing process.

The result of this focus on the instructional context are a set of findings which are applicable both to word processing and paper and pencil environments. Our emerging model of writing instruction with LD students is represented in two exhibits in this report. Exhibit 21 portrays all three instructional approaches and suggests an appropriate timing for each in the writing cycle. Exhibit 22 focuses on procedural instruction, and specifies the impact of procedural instruction on many of the outcomes critical for LD students: productivity, ownership and metacognitive awareness. Together these models argue for a balance of approaches in teaching writing to LD students. We focused in depth on how procedural instruction "works" because teachers used it least, and it is in fact a powerful approach at all stages of the writing cycle.

Consistent with our overall focus on the instructional context of word processing, we summarize our conclusions here in the form of guidelines for teachers who wish to use word processing with learning disabled students. These sugggestions respond directly to the teacher questions outlined in the first section of this report.

- Identify each student's writing strengths and problems prior to having them work on the word processor.

Any LD students referred to you for help with writing may have very different writing profiles. One student might have great strengths in generating ideas, vocabulary and sentence structure but extremely poor spelling and mechanics skills. The other student's profile may be the reverse. These differences will dictate how you might use word processing with them. Students whose major problems are not ideas or organization, but illegible handwriting, may have their problem essentially solved by writing on a computer. You may want to arrange for them to be able to use the resource room to write assignments for social studies and science, as well as for language arts.

Students who are anxious about expressing their ideas may produce even less original text on the computer because of the visibility of whatever they write and the ease with which they can erase. You may want to help these students develop some confidence in their ideas off the machine before having them use this more public writing tool. Students who are highly creative may thrive on seeing their ideas reflected back in professional print; though the computer will make it tempting to intervene and give them suggestions, these students will need "artistic" control over their writing.

- Teach your students machine skills at the beginning.

Despite the particular character of their writing problems, most learning disabled students can learn the machine skills needed for word processing. They are unlikely to acquire good typing habits, however, using all fingers and using the left hand on the left side of the keyboard and right hand on the right side, unless they have regular, short keyboard practice throughout

fourth grade. They are likely to enjoy keyboarding drills and manage keyboarding practice independently if the software has a simple format and gives them a way to track their own progress.

In a resource room setting, students can gradually acquire word processing skills such as retrieving, saving and printing, since the teacher is available to help them manage the software. This means that students need to acquire only a few basic word processing skills -- inputting text, backward delete, capitalization -- in order to begin composing. They can gradually acquire intermediate and advanced keyboarding as more complex writing demands require them. Thus students do not need to wait to begin real composing activities until they have extensive experience with word processing. This situation is unlikely to be so in the computer lab, where the high ratio of adults to children would demand that students become independent on the machine before they can focus their attention on writing.

- Have students use the word processor for composing.

Once students have acquired basic keyboarding skills, and understand how to insert, delete, and capitalize text, have them compose. Some people have been skeptical that learning disabled students can "create" as well as edit on the computer. As a result many early uses of word processing have focused on having students type a handwritten draft into the computer and then edit and print it out. It is, ironically, the revision/editing features of the computer that seem to make it such an appealing composing tool for LD students. The fact that they do not have erasure shavings to blow away, and don't have to copy over, stimulates many students to write more than they would with paper and pencil.

- If your students are fourth graders, new to word processing, provide them alternatives to revising on the computer.

Many fourth grade LD students without prior word processing experience had difficulty using the word processor for revision for several months. Deletion and insertion require having the concept of adding and substracting space, which is difficult for some students to grasp. Further, if they tried to

revise on the computer, they tended to overdelete and lose track of their text. If, as an alternative, they did their revisions on hard copy and then tried to make those revisions on-line, looking back and forth between hard copy and monitor, they tended to get confused and lose their place. Until students acquire revision skills, try these alternatives:

1) Pair an "author" with a "typist;" with the typist managing the mechanical processes and the author dictating what changes should be made. This works well if students are able to maintain their separate roles. If they begin to struggle for decision-making control over what changes should be made, the revision process will break down.

2) Work with the student, letting him take the "author" role while you act as "typist." This allows the student to think with you about what changes to make while you manage the mechanics of the revision process.

3) For students with extensive problems with mechanics and spelling, make some corrections on the students' disc outside of class, to prevent the students' becoming discouraged with excessive editing, and to ensure that their final product has correct spellings. Some teachers feel this is intrusive on their students' writing; we found it appropriate for students who would become turned off with writing if they had to correct all of their spelling errors.

While on-line revision was difficult for many fourth graders to manage, fifth graders who had used the word processor regularly for a year had no difficulty inserting and deleting within the text.

- Be wary of pushing students to edit before they have finished composing.

Because word processors are designed for making changes we are tempted to point out students' errors when they are still thinking about what to say. Computers can make anxious students even more obsessive about their mistakes if we encourage them to focus on corrections too early. If students become overly focused on spelling or on "how to say it," have them put an asterik (*) by an uncertain word or phrase and come back to it later.

- Respect students' need for control over the content of their writing.

The accessibility of the child's writing makes his composing process less private and potentially less under the child's own control. On the other hand, where children are able to maintain control over the content and

direction of their writing, the public character of the computer stimulates considerable talk among students. The visibility of their ongoing composing process can give you opportunities to reinforce and appreciate the child's writing process, and prompt further writing when the child seems to run out of ideas.

- Time your interventions according to the student's stage in the writing cycle.

Your teaching can help students acquire three different kinds of knowledge about writing: how students write, what they write, and the rules for correct and effective writing.

In general these are some guidelines for when to focus on each kind of knowledge. Focus on procedures for how to write when students are beginning a new stage of the writing cycle: generating ideas, planning, reviewing, revising, editing. Focus on the content of their writing when they have begun to generate their own ideas and will not become dependent on yours. Focus on rules and "facts" about writing when students have finished what they want to say and are ready to bring it more in line with the standards of their writing community.

- Whether students are writing off the computer or on the computer, they need procedures and strategies to help them manage different stages of the writing process.

Focus initially on teaching reluctant writers strategies they can use to generate ideas for writing, such as brainstorming on the computer or with another child; using a concrete object to help them use specific descriptive detail; stimulating their own memory process; gathering stories or information for writing from other people; taking notes; drawing a scene they are going to describe in writing. Let students use these strategies to generate their own ideas and content for writing. The series of writing activities in "I know what to say!" Writing Activities for the Magical Machine uses many of these strategies.

Procedures of this kind will benefit students with a variety of writing problems. They will help overactive, distractible students focus their attention and channel their creative energy into composing. They will prevent overly dependent students from perpetuating a cycle of helplessness and over reliance on you to suggest ideas and draw ideas out of them. Procedures can help immature writers make the transition from talking about their ideas or telling stories, to writing them.

By carrying out research together, teachers and researchers developed these suggestions for using word processors in remedial settings. The next step for this area of research is to address the setting in which learning disabled students do most of their writing: the regular classroom. Our investigation needs to address the questions that classroom teachers ask about how they can use technology to improve the writing skills of the learning disabled students who struggle to participate and to develop and express their ideas in the regular classroom.

VI. DISSEMINATION

This research has several audiences: teachers, specialists, school administrators, researchers in special education, technology and writing, teacher educators, and the funder, the Office of Special Education and Rehabilitative Services. We have used a number of strategies to disseminate emerging findings to these groups during the project.

DISSEMINATION ADVISORY GROUP

This group includes institutes and groups with interest in our research findings. Members receive written reports and updates and attended a briefing in the fall of 1986. Groups and their representatives during the two years include:

- Public school administrators, represented by Isa Kaftal Zimmerman, Assistant Superintendent of Instruction, Lexington Public Schools, Lexington, Massachusetts
- Boston Children's Hospital, Developmental Disabilities Clinic, represented by Dr. Howard Shane.
- School collaboratives, represented by Judith Sandler, Director of EDCO, a collaborative of twenty Boston area school districts.
- Council for Exceptional Children, represented by Elizabeth MacLellan, Project RETOOL.
- Boston Computer Society, Special Education Group, represented by Dr. Arthur Wood.
- Massachusetts Department of Education, represented by Roger Brown, Associate Commissioner, Division of Special Education.

PRESENTATIONS, WORKSHOPS

Teachers, administrators and specialists have received ongoing project findings through numerous conference presentations, workshops and project reports, presented within Massachusetts and nationally (see Exhibit 23). We

EXHIBIT 23

EDC Writing Project
Presentations/Papers
1984-87

Audience	Presentations/Papers*
Teachers/specialists/ administrators	Council for Exceptional Children Annual Meeting, Anaheim, California. 1985 (C. Morocco)
	Microcomputers in Special Education, Summer Institute, Lesley College, Cambridge, MA. Summers, 1985, 1986 (C. Morocco)
	Symposium on Wordprocessors and Writing, Massachusetts Teachers' Association Annual Meeting, Sturbridge, MA. April 1986 (S. Neuman and five project teachers)
	Micro-ideas Conference: The Role of Computers in Education, Arlington Heights, IL. February 1986 (C. Morocco)
	National Technology and Media Conference, Alexandria, VA. January 1987 (C. Morocco) Boston Computer Society. May 1986 (S. Neuman)
Researchers	"Developing Ownership in Writing," National Reading Conference, San Diego, CA. December 1985. (S. Neuman)
	Symposium: Creating Intelligent Environments for Computer Use in Writing, American Education Research Association (AERA), San Francisco, CA. April 1986 (C. Morocco; S. Neuman)
	Assembly on Research at The National Council of Teachers of English, Philadelphia. November 1985; San Antonio, Texas, November 1986. (C. Morocco)

EXHIBIT 23
(Continued)

Audience	Presentations/Papers
Researchers, continued	Research Report, OSEP Project Directors' Meeting, Washington D.C. July 1986 (C. Morocco)
	Research Report, Invitational Research Symposium on Special Education Technology. June 1986 (C. Morocco)
	Writing and Computers Conference, Pittsburgh, PA. March 1986 (C. Morocco)
Clinicians	Learning Disabilities Clinic, Children's Hospital, Boston, MA. January 1986 (C. Morocco)

have made a number of presentations also to the technology and special education and writing research communities, and make our research methods available to those groups in the Appendix of this report.

PUBLICATION

As part of a writing research series, a commercial publishing company has agreed to publish a book on special needs children and word processing. A contract for that book will be negotiated in early 1987. The book will draw on findings from this project, and from a new project on word processing for learning disabled children in the mainstream classroom which EDC is currently conducting.

Another commercial publisher is currently considering a plan to publish classroom materials for teachers and children, based on an expanded version of the classroom activities developed in this project (See "I know what to say!" Writing Activities for the Magical Machine.

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APPENDIX: RESEARCH METHODS

GENERAL APPROACH

The research was carried out in two phases, each a year long. The overall purpose of Year I was to document, through intensive observation, the diverse ways that five remedial teachers used word processing with resource room students. This early study of the status quo would provide us detailed information about the use of word processing in remedial settings and a guiding framework for effective word processor use in that setting. We felt that "ideal" models of word processor use which emerged from the project should take into account the practical constraints, patterns of computer access, and teacher attitudes and philosophies that characterize the resource room.

The overall purpose of Year II was to develop and field test a series of innovative word processing approaches and activities that reflected the framework developed in Year I. While teachers selected for Year I approached word processing in highly diverse ways, teachers selected for Year II worked within a common instructional framework to explore the possible impact of word processing on learning disabled children's skills in planning, transcribing ideas in writing, and revising.

RESEARCH DESIGN: YEAR I

The project used a comparative observational design in Year I to document unique features and commonalities of the five remedial classrooms. The key feature of comparative observational studies is lack of planned or controlled intervention or allocation of people and treatments. They are similar to case studies in that data are gathered from natural settings, without intervention. They differ in having a systematic and planned collection of data over several institutions (in this case, classrooms). This design makes it possible to follow several groups or institutions over time, note differences in how they change, and look for factors contributing to differences and changes. While

the lack of controlled treatments or comparisons means that one cannot draw causal inferences, the design is ideal for hypothesis development in new research areas (Hoaglin et al. 1982).

Sample

Teachers. We selected five remedial teachers with considerable levels of experience in using word processing, given the newness of the field. All met these minimal criteria:

- Has three years' experience teaching LD students.
- Has one full year's experience using word processing with LD students.
- Considered an exemplary teacher by their school administrators.
- Works with a minimum of three fourth grade LD students.
- Has a minimum of one computer for every three students.
- Teaches in a remedial setting.

Exhibit 24 describes the five classrooms, including the school district, remedial setting, other adults present, total number of fourth grade LD students in that setting, number of children in the study, and number of computers.

School Districts. To ensure diversity in our student population, we selected teachers from at least three different and socioeconomically diverse school districts. One district is an inner-city community with a high percentage of low-income minority families; one includes low-average to high-income families and is ethnically diverse; the third is in an affluent, mostly white, suburb.

Learning Disabled Students. None of the fourteen students (three per classroom with the exception of one classroom) were achieving as expected, particularly in reading and writing. They had diverse learning and writing problems, socioeconomic backgrounds, and ethnic backgrounds (six Black, two Hispanic, five white).

EXHIBIT 24
Remedial Sites: Year I

TEACHER	DISTRICT/SCHOOL	REMEDIAL SETTING	OTHER ADULTS	TOTAL CHILDREN IN GROUP	NO. CHILDREN IN STUDY	NO. OF COMPUTERS
A	I Low income, inner city	Small-group 4th grade tutorial	Aide	3	3	3
B	I Low income, inner city	Substantially separate LD classroom for 9- and 10-year olds	Aide	11	3	1
C	*III Middle-high income, suburb	Grades 4-6 learning center	None	3	3	2
D	IV Middle-high income, suburb	Grades 4-6 learning center	None	2	2	2
E	II Low-high income, small city	Grade K-6 learning center	None	3	3	1

* One teacher in site II is a district-wide director of a federally funded mainstreaming program; the other is a teacher of the district-wide K-2 substantially separate classroom. Each is teaching a small group of mildly LD 4th graders that was brought together for this study. Both teachers are working with students in the same elementary school.

Data Collection Procedures/Instruments

Exhibit 25 summarizes the data collection procedures and instrumentation for Year I. We interviewed teachers in two one-hour sessions early in the year to learn about their assumptions about LD students as learners and writers, how they taught writing to their LD students, and how they felt word processing benefits or limits LD students. During the first interview, we asked them to assess their LD students (in our sample) as learners and writers. In the second interview, we showed them the writing samples we had collected from students and asked the teachers to comment on them.

We used procedures and stimuli of the the National Assessment of Educational Progress (NAEP) to secure three samples of students' writing at the beginning and end of the year. We developed a brief questionnaire for students on their experience with computers and attitudes towards writing. Previous exhibits in the case study section display the NAEP stimuli used over the two years: Fireflies, Goldfish, Puppy Letter, Rules, and Flashlight. Between October and June, we observed each classroom every two weeks, tape-recording the teachers' interactions with students at the computer and keeping a running record of individual students' activities at the computer. We transcribed those tape recordings, integrated them with the running record, and summarized the observation using a guide whose focus and questions evolved over the several months of observation.

We collected printouts of each days' writing, whether or not we observed that session, and attached those writing products to the relevant observation protocols. We developed 80 observation protocols in this way, each documenting approximately 45 minutes of computer-based writing activity. These "rich" data sets provided the major data for comparative analysis of teacher approaches and student writing processes.

Monthly meetings developed rapport between teachers and EDC staff, which was critical to our continued contacts with teachers in their classrooms. The meetings also provided teachers with informal opportunities to share ideas and viewpoints and gave the EDC staff opportunities to provide information and feedback to teachers. Meetings were tape-recorded and transcribed.

EXHIBIT 25
Data Collection Procedures/ Instruments - Year I (1984-85)

Procedures	Instrument(s)	Purpose/Focus	No. of Recipients	Time of Administration
Interview teachers	Structured interview schedule	Identify assumptions/LD students Approach/writing instruction Assessment/LD sample Expectations/word processor use	5 teachers	2 1-hour interviews/September-October 1984
Assess LD students	• NAEP writing assessment	Identify students' writing strengths and problems	14 LD students	October 1984 (pre) May 1985 (post)
	• Student questionnaire	Self-report of prior use of computers; writing done at home; enjoyment of writing; view of self as writer	14 LD students	October 1984
	• Child Profile	Teacher rates child's strengths and problems as a learner and writer; collect standardized test scores in reading, mathematics, vocabulary; writing from student records; IEP goals and objectives	5 teachers	November 1984
Observe remedial classrooms	Running record, combined with tape recorded teacher-child interaction and observation summary guide	Document student use of word processor and teacher/child interactions around computer	14 LD students 5 teachers	Bi-weekly - October 1984 - June 1985
Collect student writing products	Writing folder/all entries dated, hand and computer written	Accumulate record of child's writing over school year	14 LD students	Ongoing - October 1984 - June 1985

EXHIBIT 25
(Continued)

Procedures	Instrument(s)	Purpose/Focus	No. of Recipients	Time of Administration
Meet with teachers	Tape recorded and transcribe discussion	Develop rapport with teachers; teacher sharing; EDC staff presented feedback and research procedures	5 teachers 2 EDC staff	Every 6 weeks, October 1984 - June 1985
Collect teacher assignments/ lessons	Teacher log Folder of sample writing assignments/ materials for students	Record schedule and type of computer writing activities Document teachers' writing program	5 LD teachers	Ongoing - October 1984 - June 1985

Data Analysis

Exhibit 26 summarizes data anlayses carried out in Year I. Briefly, we carried out a series of five qualitative analyses. The first three were aimed at identifying effective instructional uses of the word processor, the fourth focused on students' mastery of keyboarding and word processing skills, and the fifth focused on word processor features contributing to effective and ineffective writing instruction.

Effective Instructional Uses of Word Processing. The first analysis identified teachers' general approaches to integrating the computer into instruction. This analysis drew on teacher interviews, approximately fifteen observation protocols for each teacher, records of teachers' assignments, and teacher meeting transcripts. Our procedure reflected Shatzman's and Strauss' (1973) approach to "triangulating" several data sources, to identify elements in the teachers' general approach to writing instruction that linked and differentiated them. The result was a preliminary identification of three approaches, "skill building," "guided writing," and "strategic," each reflecting different assumptions about writing, writing needs of LD children, teacher roles, and computer roles in the writing process. (See Technical Report No. 1).

A second analysis identified the specific ways teachers intervene to help students write when they are at the computer. For this analysis, we coded every verbal intervention of the five teachers in the 80 observation protocols. The result was a set of intervention categories including such techniques as "re-reading child's text aloud from the monitor," "providing conversational models," and "expanding the child's text."

A third analysis focused on the impact of teacher approaches and intervention techniques on students' writing process. We used the following procedure for this analysis:

a) Selected all writing episodes from the observation protocols (n=20) across the five classrooms in which students were generating first drafts;

EXHIBIT 26
Data Analyses - Year I

TOPIC	PURPOSE	DATA	METHOD OF ANALYSIS	RESULT/PRODUCT
Teachers' Approach	Describe teachers' general approaches to integrating computers into writing	Teacher interviews; observation protocols; teacher assignment; meeting transcripts	Triangulate multiple data source	Preliminary documentation of teacher approaches. Technical Report No. 1
Teacher Intervention Techniques	Identify specific ways teachers intervene to help students write at computer	Observation protocols	Categorize all teacher verbal interventions across five classrooms	Categories of "Facilitating Teacher Interventions." Technical Report No. 2
Impact on Student Writing	Generate hypothesis-impact of teacher approaches/interventions on student engagement and ownership	20 writing episodes - students producing first draft	Compare high engagement/low engagement episodes	Model-Facilitating vs. Compliance Interventions. Guidelines - effective interventions at the computer. Technical Report No. 2
Student Mastery of Keyboarding and Word-processing Skills	Identify word processor roles in writing process	Observation transcripts; student writing products; interviews	Summarize & categorize word processor uses across all writing activities in all classrooms	Summary of possible word processor roles in writing for LD students. Technical Reports No. 3 and 5.

b) Divided the episodes into three groups, high, medium, and low, in terms of evidence of students' level of involvement in writing during the episode. Interpretations of involvement level were based on: 1) productivity--the child physically produces written text; 2) attention to writing--the child focuses on the content of the writing by rereading and talking about content with others; 3) ownership/pride--the child evidences interest in the product by asking to read it aloud or take printout home.

c) Compared "high" and "low" episodes in terms of the instructional context, including general teacher approach and specific intervention techniques used. We looked for patterns of teacher approach, teacher intervention, and other "unanticipated" factors which appeared to contribute to high or low student involvement with writing at the computer.

The results of the second and third analyses were a model of "facilitating" versus "compliance-oriented" word processing environments and a set of hypotheses about instruction and student involvement for further investigation in Year II. (See Technical Report No. 2)

Mastery of Word Processing/Keyboarding

This analysis focused on the type of keyboarding and word processing instruction students received and the level of mastery they achieved during the year. This was an exploratory analysis, since the study was not designed to provide systematic data on this issue. Because our focus was on what teachers naturally do, we did not intervene to promote specific keyboarding instruction. We drew on observers' regular comments about students' "machine skills" in the observation protocols, observation data on teaching interventions related to keyboarding and word processing, teacher log data, and teacher reports of keyboarding activities. (See Technical Report No. 4 for findings)

Computer Features

The fifth analysis focused on word processor features that contributed to writing instruction. This analysis also drew on a triangulation of observation, interview, and meeting data, and involved extracting and categorizing all of the varied uses of the computer for writing across the five classrooms. (See Technical Report No. 5 for findings).

RESEARCH DESIGN: YEAR II

The project used a field test design in the second year to investigate how specific writing activities might embody principles of effective word processor instruction identified across the five classrooms in Year I. The shift was prompted by our clear finding that few of the project teachers were making use of the potential of word processing with their students. Most stressed a "skill building" approach, which used revision features of the word processor to correct spelling, formatting, and mechanical errors in students' writing. Although the word processor has powerful features that can support composing and sharing author's ideas--for example, the open accessible screen, easy printing out of copies to share, easy insertion and deletion--the machine's powers were directed mainly to lower-order writing skills.

Exhibit 27 portrays a dynamic model of the field test procedures in Year II, including the steps in data collection and the three kinds of results: increased base of knowledge, directions for revising the trial word processing activities, and an understanding of teacher training and development needs.

Sample

Core Teachers

Two teachers from the first-year group expanded their role in the project to collaborate with EDC staff in designing and field testing writing activities that integrated the computer into good writing instruction and focused on higher-order student abilities, particularly on planning and generating ideas for writing. The teachers were selected for their talent and their interest in assuming a larger role in the project.

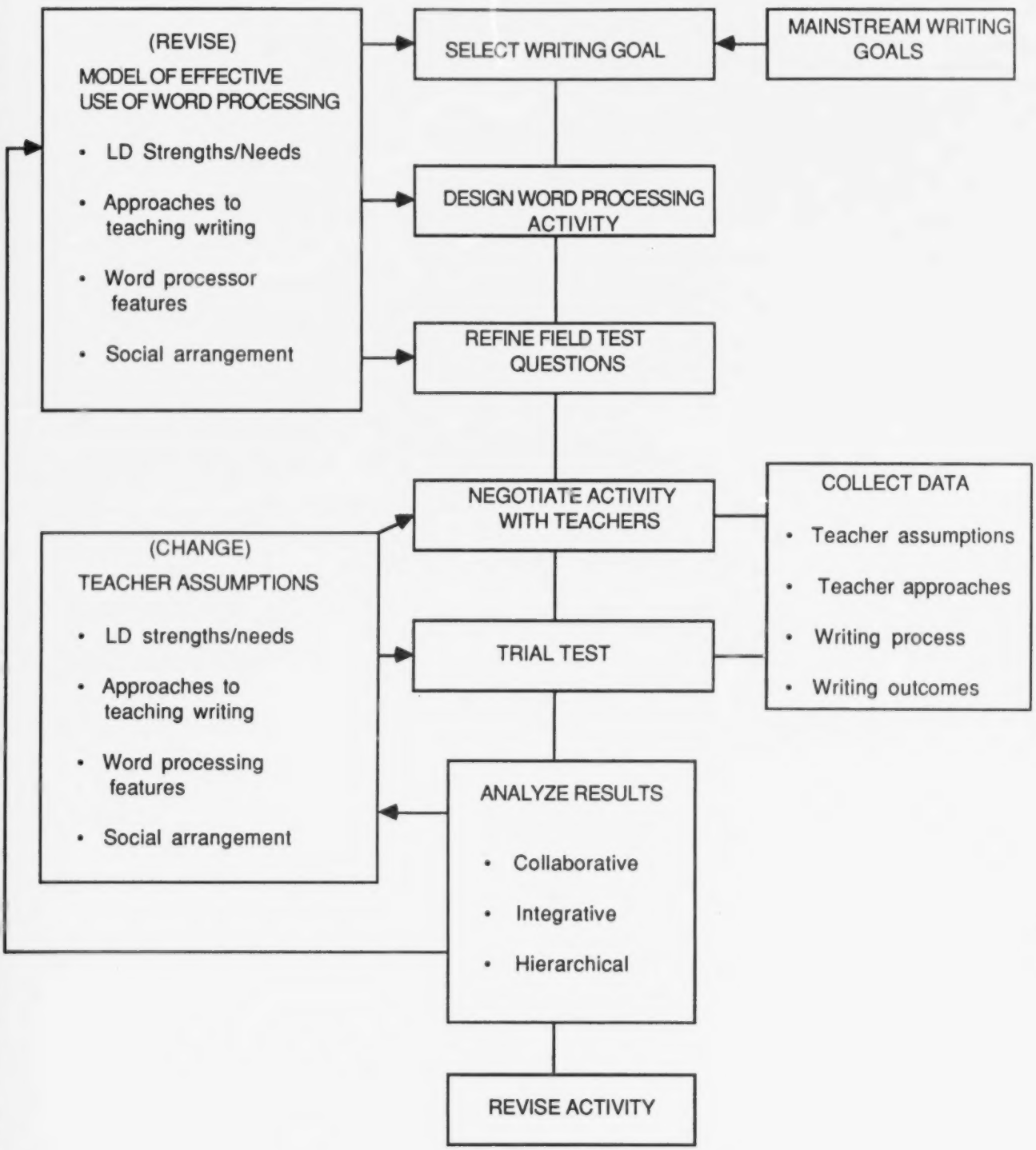
Field Test Teachers

One of the remaining three teachers was promoted to a sixth grade classroom teacher position but continued as a consultant to the project. Two had a substantially separate classroom with severe, multiproblem (as well as LD) students; it was our feeling that these students required approaches different

EXHIBIT 27

FIELDBASED RESEARCH MODEL

Instructional Design Cycle: Word Processing
Activities for LD Students in Remedial Settings



from our innovative activities, which were aimed at mild-to-moderate problems. The third teacher preferred to use the new materials at her own discretion and in a less structured and sequential way than was required for participation in the field test.

Four new teachers constituted a "second tier" of teachers to field test the writing activities after they were first adapted and piloted by the two core teachers. The four new teachers were selected to determine whether the new materials could stand on their own in settings that had not previously been involved with the research project. Two teachers were selected from a middle-income city, the other two from a low-to-medium income, ethnically diverse city.

Core Students

We selected eight LD students to field test the new writing activities with the two core teachers. Four of these students were fifth graders who had participated in the project in Year I, four were new fourth graders. This sample enabled us to adapt and field test new activities with experienced teachers, and with both "old hand" and "newcomer" students.

Field Test Students

Eleven students field tested the innovative activities in the four new field test settings. These students ranged from fourth to sixth grade. All had normal intellectual abilities but were performing considerably below their expected levels in writing.

Data Collection Procedures/Instruments

Exhibit 28 summarizes the specific data collection procedures and instruments for Year II. NAEP procedures were again used to gather pre-post writing samples from the eight "core" LD students. The Year I classroom observation procedure was continued in Year II to document both teachers' adaptation of

EXHIBIT 28
Data Collection Procedures/ Instruments - Year II (1985-86)

Procedures	Instrument(s)	Purpose/Focus	No. of Recipients	Time of Administration
Assess LD Students	NAEP writing assessment; IEP goals and objectives	Identify students' writing strengths and problems	8 LD students	October 1985 (pre) May 1985 (post)
Observe core classrooms	Observation guide	Document teacher and student use of innovative writing activities	2 core teachers; 8 LD students, 4th and 5th grade	All writing sessions - twice weekly. November 1985 - June 1986
Collect student writing products	Writing folder/all entries dated - hand and computer written	Accumulate record of child's writing over school year; compare results of different word processing activities	8 LD students	Ongoing - November 1985 - June 1986
Interview Field-test Teachers	Structured telephone interview schedule	Gather results of field test of innovative materials in "second tier" classrooms	4 Field-test teachers; 11 LD students; 4th-6th grade	Ongoing - January - June 1986
Meet with Core Teachers	Tape recording of sessions	Refine innovative activities: negotiate teacher piloting of activities	2 LD teachers; 3 EDC project staff	Approximately monthly - November 1985 - June 1986
Interview Core Teachers	Structured interview schedule	Gather core teacher's perceptions of their growth and change over two years in project and perceptions of word processing impact on students	2 core teachers	June 1986

the new writing activities, and students' response. Teachers met with their students two hours per week in an informally arranged computer lab, and we observed and tape recorded all writing sessions.

The new writing activities were piloted with the core teachers, revised on the basis of observed strengths and problems, then field tested with the "second tier" field test teachers. We used biweekly telephone interviews with the four field test teachers to gather their opinions about the clarity and usefulness of the materials and students' response.

We held an extensive, semistructured interview with the two core teachers at the end of Year II. We wanted to learn how they thought their two years of participation in the project had affected their own teaching approaches. In addition, we wanted their assessment of the progress of the four students who had participated in the project over the two years, as well as the progress of the four new fourth grade students.

Data Analysis

Exhibit 29 summarizes Year II data analyses. One of our major analyses relates directly to the first two major research questions outlined in Framework and Questions: What approaches to teachers bring to teaching writing with word processing? What approaches are most effective? Does a word processing environment change teachers' approaches? In this analysis we used two years of observation data to finalize our description of remedial teacher approaches. Because we had two years of observation data for the two core teachers, we wanted both to characterize their teaching approaches during the time, and see whether they had changed their approaches over the 24 months that they had participated in the project. We had the strong impression that their approaches did change in Year II, and that the many months of participating in feedback sessions, in helping us develop and pilot "model" writing activities, even making presentations about the project at state reading association meetings, had had an impact on their teaching.

EXHIBIT 29
Data Analyses - Year II

TOPIC	PURPOSE	DATA	METHOD OF ANALYSIS	RESULT/PRODUCT
Teacher approaches	Characterize instructional contexts for word processing; document change in instructional context over time	Two years of observation protocols; teacher interviews beginning in Year I, end of Year II	Code and quantify teacher interaction; compare Year I and Year II data	Final documentation of teacher approaches. Final report.
Word processor roles	Identify how the word processor is used in different instructional contexts	Observation protocols, Years I and II	Compare computer use in three instructional contexts	Recommendations for a more procedural use of word processing. Final report.
Individual LD student and word processing	Analyze the impact of different instructional contexts on different types of LD students	Student test and assessment data; observational protocols; student writing products, Years I and II	Relate individual student writing process and products to three instructional approaches	Core profiles of three LD students. Proposition on the impact of instructional approach in different LD types. Final report.
Writing Activities for Remedial Settings	Revise writing activities based on field test results	Year II observation protocols; teacher meetings and interviews	Compare modules in terms of student productivity, involvement, quality of product	Resource Guide for stimulating writing with word processor

We used this procedure:

a) Developed a system for coding and quantifying the observation protocols gathered for the two core teachers over two-year period. Drawing on all of our observation transcripts, we developed an exhaustive set of categories to describe both the function and instructional approach of teachers' verbal interactions with students as they carried out writing activities. Teachers used an extremely rich variety of prompting, mirroring, and rehearsing techniques which were partially identified in Year I. The purpose of the "approach" category was to get beyond the very rich and varied, specific techniques to the basic underlying approach to instruction. An overview of the coding system is presented in Exhibit 30.

b) Coded the verbal interactions of the two core teachers with their students over the two years of the project. For this analysis we selected a random sample of twelve Year I and twelve Year II transcripts for each teacher. Thus, we coded a total of 24 transcripts for each teacher.

c) Compared teachers' interventions in Years I and II in terms of the frequency of each intervention and type of approach.

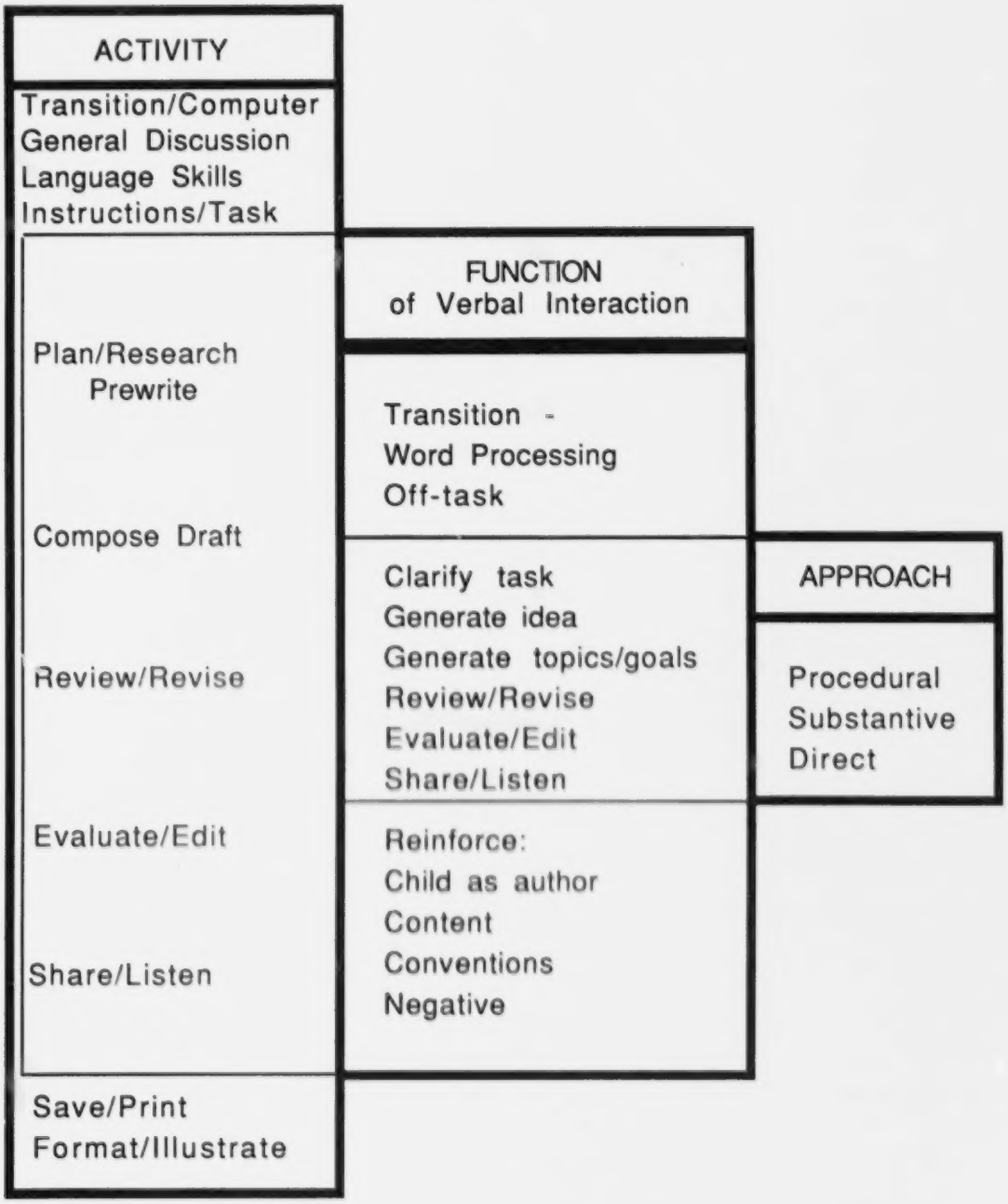
A second analysis relates to the research questions: What are the unique features of word processors as writing tools for learning disabled children? How can these features support good writing instruction with LD students? Our purpose was to identify how the word processor can support different instructional approaches and to recommend word processor roles that are most powerful with LD children.

A third analysis at the end of Year II related directly to the research question: What is the impact of word processing on the writing abilities of learning disabled children? In this analysis, we selected three students with very different writing problems. We drew on assessment and observation data to determine how they responded to substantive and procedural approaches to writing instruction and how they used word processing in each kind of instruction.

Finally, we analyzed observation transcripts and teacher meetings to determine the strengths and problems of the model writing activities and to identify ways to revise and expand them. Those results are discussed briefly in the

EXHIBIT 30

Coding System
Teacher Verbal Interactions in Remedial Settings.



Dissemination section. The revised set of activities is separately bound as teacher resource materials titled, "I know what to say!": Writing Activities for the Magical Writing Machine.

Instructional Materials

In the first two months of Year II project staff, together with the two core teachers, designed seven activity "modules." The modules reflected our growing base of knowledge about LD students' writing needs, effective instructional contexts for word processing, and powerful features of word processing for LD students. Each module contained several elements aimed at both training the teacher and helping reluctant LD writers generate a rich abundance of ideas for composing. Those elements included:

- Writing objectives
- Planning activities for generating topics and ideas
- Vocabulary development
- Sequence of writing activities
- Sample student writing products
- Suggestions for integrating literature with the module
- Extended writing activities for students needing more practice or challenge

Modules spanned Britton's (1975) three major kinds of writing: expressive (journals, personal anecdote), functional (directions, reports, argument/persuasion), and poetic (poetry and fiction).

Exhibit 31 lists the revised set of modules at the end of Year II. These are available, bound separately as "I know what to say!" Writing Activities for the Magical Machine.

EXHIBIT 31

Model Writing Activities

PERSONAL DATA FILE Using the Computer as a Journal

ON-LINE CONVERSATIONS Using the Computer as a Dialogue Journal

COME TO YOUR SENSES! Using Observation to Write Detailed Descriptions

THE MIRACULOUS MEMORY MACHINE Using Memories to Write Personal Narrative

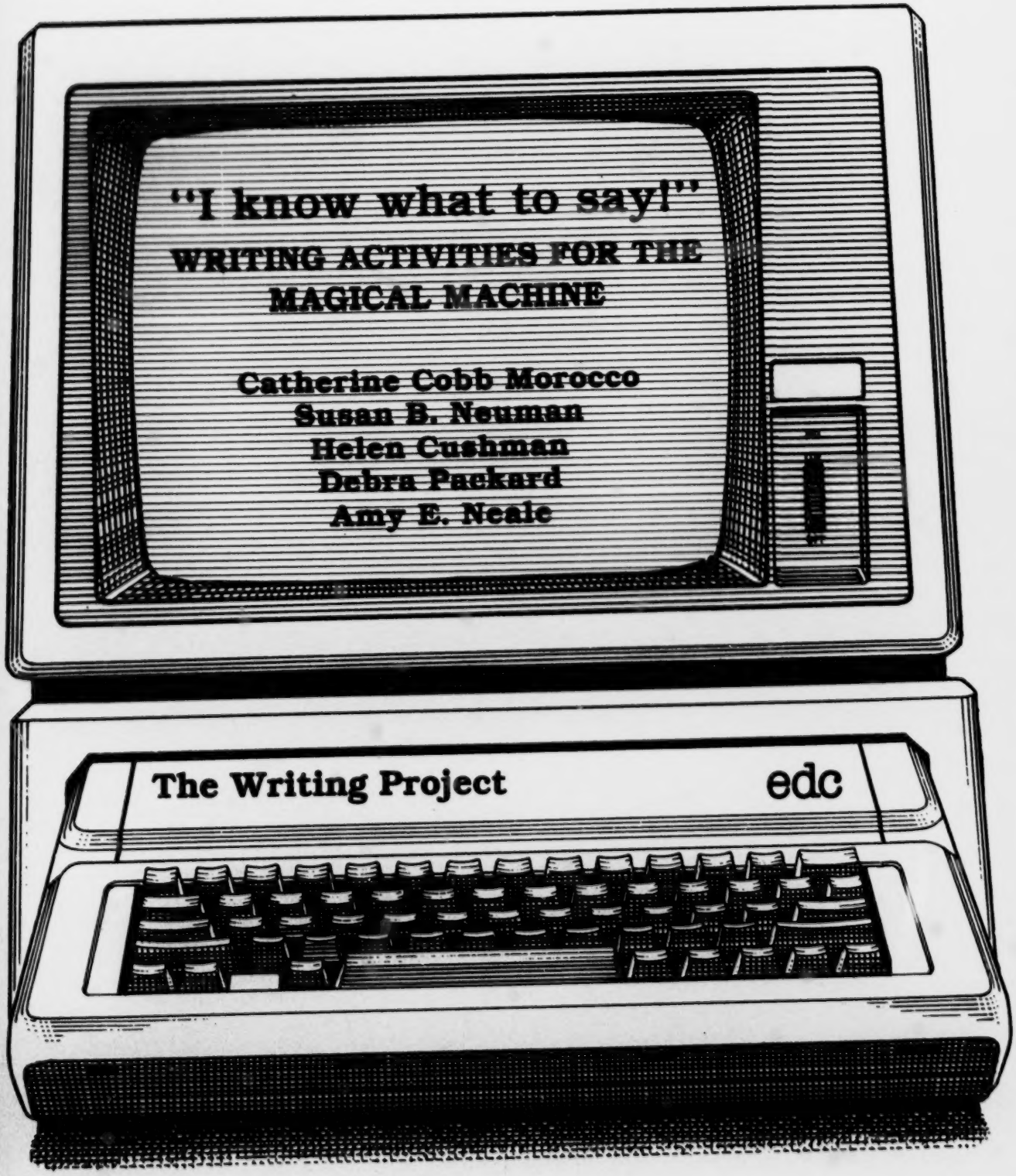
FROM TALKING TO FICTION Using Dialogue to Write Stories

FANTASTIC FABLES Writing a Story that Illustrates a Point

SPECIAL LIVES Using Interviewing to Tell Other People's Stories

"HOW TO MAKE..." Writing Directions for How to Make and Do Things

MAKING A DIFFERENCE Responding in Writing to Contemporary Events


"I know what to say!"
WRITING ACTIVITIES FOR THE MAGICAL MACHINE
Catherine Cobb Morocco
Susan B. Neuman
Helen Cushman
Debra Packard
Amy E. Neale
The Writing Project
edc

"I know what to say!"
Writing Activities for the Magical Machine

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February 1987

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This work was part of a larger research project funded by the U.S. Office of Education, Special Education Programs. A final report of the project can be obtained by contacting:

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INTRODUCTION

ABOUT THESE ACTIVITIES

This report presents nine instructional activities designed to assist learning disabled students write more effectively, using word processing. These nine writing activities grew out of a study of resource room teachers who were using word processing with fourth and fifth grade children. Over a two year period, staff from Education Development center (EDC) observed expert resource room teachers help children use computers to plan, compose, revise, edit and publish their writing. The students were all normally intelligent but struggling to express themselves in writing and discouraged about themselves as writers.

Students had a variety of problems. Some were hampered by attention problems, others by illegible handwriting, and still others by problems with processing directions, expressing a coherent sequence of ideas, or mechanics and spelling. All of them had enormous difficulty getting started with writing.

The following activities are the result of teachers trying out many approaches while researchers observed what "worked." The activities focus mainly on the "front end" of writing -- giving students strategies for generating ideas and sustaining their involvement in a piece of writing. For example, students use observation of concrete objects to generate specific sensory details in description; memory processes to generate material for personal narratives, and graphic organizers to plan a set of arguments for a persuasive letter.

The activities provide students with one major kind of revision strategy: review questions that are related to the "key features" of the students' writing. For example, key features of a persuasive letter include presenting a problem, offering a solution, and supporting the solution with specific arguments. Students are encouraged to ask themselves "Did I state the problem?" "Did I tell the best solution?" "Did I give reasons why it is the best?" You will want to focus on additional revision and editing issues, depending on your students' writing needs.

Several unique features of word processing can support you in carrying out these activities. Electronic writing converts illegible handwriting. The revision features of the word processor encourage students to write more, since they do not have to copy over, and make it easier for them to make changes. You will find that the computer also makes students' writing processes more accessible. You will see what they are writing and when they are having difficulties.

SUGGESTIONS FOR TEACHERS

The following guidelines, drawn from two years of research on word processing, can help you in using the instructional activities described here and in creating your own activities.

Identify writing strengths and problems prior to having them work on the word processor.

Two students referred to you for help with writing may have different profiles. One student may have great strengths in generating ideas, vocabulary and sentence structure, but extremely poor spelling and mechanics skills; another student's profile may be the reverse. These differences will dictate how you might use word processing with them. Students whose major problems are not ideas or organization, but illegible handwriting, may have their problem essentially solved by writing on a computer. You may want to arrange for them to be able to use the resource room to write assignments for social studies and science, as well as for language arts.

Students who are anxious about expressing their ideas may produce even less original text on the computer because of the visibility of whatever they write and the ease with which they can erase. You may want to help these students develop some confidence in their ideas off the machine before having them use this more public writing tool. Students who are highly creative may thrive on seeing their ideas reflected back in professional print. Though the computer will make it tempting to intervene and give them suggestions, these students will need "artistic" control over their writing.

Teach your students machine skills at the beginning.

Despite the particular character of their writing problems, most learning disabled students can learn the machine skills needed for word processing. They are unlikely to acquire good typing habits, however, unless they have regular, short keyboard practice throughout fourth grade. The purpose of keyboarding practice is for students to:

- Become familiar with the locations of all letters and punctuation keys on the computer keyboard.
- Use all fingers and use the left hand on the left side of the keyboard and the right hand on the right side.
- Develop a level of fluency in typing which allows students to type at a rate concomitant with the flow of their ideas in writing.

Students are likely to enjoy keyboarding drills and manage keyboarding practice independently but their keyboarding should be monitored at regular intervals. Furthermore, the software should:

- Accept only correct responses with incorrect letters or words indicated by a soft, low sound.
- Provide instruction directly on the monitor, thus eliminating the need for the child's eyes to move from one point to another.
- Introduce new skills gradually.

- Provide a method of determining one's progress in keyboarding.
- Provide some opportunity for children to practice keyboarding skills in a game-like format.

In a resource room setting, students can gradually acquire word processing skills such as retrieving, saving and printing, since the teacher is available to help them manage the software. This means that students need to acquire only a few basic word processing skills -- inputting text, backward delete, capitalization -- in order to begin composing. They can gradually acquire intermediate and advanced software functions as more complex writing demands require them. Thus students do not need to wait to begin real composing activities until they have extensive experience with word processing. This situation is unlikely to be so in the computer lab, where the high ratio of adults to children would demand that students become independent on the machine before they can focus their attention on writing.

Have students use the word processor for composing.

Once students have acquired basic keyboarding skills, and understand how to insert, delete, and capitalize text, have them compose. Some people have been skeptical that learning disabled students can "create" as well as edit on the computer. As a result, many early uses of word processing have focused on having students type a handwritten draft into the computer and then edit and print it out. It is, ironically, the revision/editing features of the computer that seem to make it such an appealing composing tool for LD students. The fact that they do not have erasure shavings to blow away, and do not have to copy over, stimulates many students to write more than they would with paper and pencil.

If your students are fourth graders, new to word processing, provide them alternatives to revising on the computer.

Many fourth grade LD students without prior word processing experience had difficulty using the word processor for revision for several months. Deletion and insertion require having the concept of adding and substracting space, which is difficult for some students to grasp. Further, if they tried to revise on the computer, they tended to overdelete and lose track of their text. If, as an alternative, they did their revisions on hard copy and then tried to make those revisions on-line, looking back and forth between hard copy and monitor, they tended to get confused and lose their place. Until students acquire revision skills, try these alternatives:

1) Pair an "author" with a "typist," with the typist managing the mechanical processes and the author dictating what changes should be made. This works well if students are able to maintain their separate roles. If they begin to struggle for decision-making control over what changes should be made, the revision process will break down.

2) Work with the student, letting him take the "author" role while you act as "typist." This allows the student to think with you about what changes to make while you manage the mechanics of the revision process.

3) For students with extensive problems with mechanics and spelling, make some corrections on the students' discs outside of class, to prevent the students' becoming discouraged with excessive editing, and to ensure that their final product has correct spellings. Some teachers feel this is intrusive on their students' writing; we found it appropriate for students who would become turned off with writing if they had to correct all of their spelling errors.

While on-line revision was difficult for many fourth graders to manage, fifth graders who had used the word processor regularly for a year had no difficulty inserting and deleting within the text.

Save editing for last.

Because word processors are designed for making changes we are tempted to point out students' errors when they are still thinking about what to say. Computers can make anxious students even more obsessive about their mistakes if we encourage them to focus on corrections too early. While students must eventually learn and demonstrate familiarity with mechanics, this is best done at the end of the writing activities. If students become overly focused on spelling or on "how to say it," have them put an asterik (*) by an uncertain word or phrase and come back to it later.

Respect students' need for control over the content of their writing.

The accessibility of children's writing makes their composing process less private and potentially less under their own control. On the other hand, where children are able to maintain control over the content and direction of their writing, the public character of the computer stimulates considerable talk among students. The visibility of their ongoing composing process can give you opportunities to reinforce and appreciate the child's writing process, and prompt further writing when the child seems to run out of ideas.

Time your interventions according to the student's stage in the writing cycle.

Your teaching can help students acquire three different kinds of knowledge about writing: how students write, what they write, and the rules for correct and effective writing.

In general these are some guidelines for when to focus on each kind of knowledge. Focus on procedures for how to write when students are beginning a new stage of the writing cycle: generating ideas, planning, reviewing, revising, editing. Focus on the content of their writing when they have begun to generate their own ideas and will not become dependent on yours. Focus on rules and "facts" about writing when students have finished what they want to say and are ready to bring it more in line with the standards of their writing community.

Whether students are writing off the computer or on the computer, they need procedures and strategies to help them manage different stages of the writing process.

Focus initially on teaching reluctant writers strategies they can use to generate ideas for writing, such as brainstorming on the computer or with another child; using a concrete object to help them use specific descriptive detail; stimulating their own memory process; gathering stories or information for writing from other people; taking notes; drawing a scene they are going to describe in writing. Let students use these strategies to generate their own ideas and content for writing. This series of writing activities uses many of these strategies.

Procedures of this kind will benefit students with a variety of writing problems. They will help overactive, distractible students focus their attention and channel their creative energy into composing. They will prevent overly dependent students from perpetuating a cycle of helplessness and relying overly on you to suggest ideas and draw ideas out of them. Procedures can help immature writers make the transition from talking about their ideas or telling stories, to writing them.

PERSONAL DATA FILE
Using the Computer as a Journal

INTRODUCTION

The Personal Data File is a journal that students write regularly -- "on line" or by hand. Writing every day is a powerful way to help students develop fluency and ease in expressing their ideas in writing. Writing is seldom effortless because we have to manage so many thinking processes when we write. We recall what we know, choose words, transcribe or type them, generate more ideas, manage our anxious feelings, and much more. The best way to begin to coordinate all these processes is to write often.

Journal-writing can help students begin to be fluent in a wide variety of genre. In writing about whatever is most on their minds, students may spontaneously produce many different kinds of writing. Telling a story, expressing an opinion, describing someone, listing things to do, outlining a plan, putting strong feelings into words, all can happen naturally in a journal and are the seeds of many genres.

A journal is to be read periodically by the teacher and shared with other students at the writer's choice. It is not evaluated. Knowing that their writing won't be judged eases students' anxiety and frees them to focus on what they want to say. A journal can help them get comfortable with themselves as writers.

This guide includes specific objectives for journal-writing, ways to use the word processor as a journal, strategies for getting started, things the teacher should and should not do, ways to integrate reading and vocabulary development, and writing activities that can build on the journal.

Objectives

- Increase fluency, i.e. rate of expressing ideas in writing
- Learn to use specific strategies for listening and responding to other students' writing
- Become comfortable with expressing feelings and experiences in writing
- Enjoy writing frequently

Key Features of Journals

A Journal:

- Is written in first person "I"
- Examines the writer's own experiences and thoughts and memories
- Is written frequently over a period of time

Word Processor Skills

Skills: enter text, use backward DELETE, capitalize

Managing access: Journals can be kept on the computer, by hand, or both. If students will be using both, a three-hole punch notebook can hold easily both their hand-written and typed entries. Keep a three-hole punch close to the computer area.

HELPING STUDENTS ACQUIRE JOURNAL SKILLS

Some students will need a great deal of help getting started; others won't. The steps below are designed to move students toward increasing independence in keeping a regular journal.

Model Journal Writing

Set up a file for yourself, and make a journal entry during class. Students will quickly get the idea of writing about their experiences and will see the different ways they can use the journal (for planning, letting off steam, writing about a person or event).

Writing is inherently risky and personal. When students see that their adult teacher also erases, gets stuck, then finds words and is willing to go through that process in front of them, they will be more willing to try it. Students will reveal more of themselves in writing if they see the teacher is doing the same. Example 1 focuses on a girl who thought of herself as slow and boring and was reluctant to write about herself in any way. She was very much encouraged when she discovered that her teacher also felt slow when she was in school.

After you write, read your entry to students and let them ask questions. After you have done this once or twice, have students go to their journals or to their computer file, and write an entry of their own.

Provide Questions

Give students a "starter" question like those below or have them select a question from a list that you post. Students can add questions to the list:

> Have you ever had a scary experience? What was it like?
>
> Who was/is your favorite teacher? What was he/she like?
>
> List all of your most favorite foods. Which is the best? Tell about it!
> When did you first learn to ride a bicycle? What do you remember about it?
>
> Have you ever had a bad day when everything seemed to go wrong? What was it like?

Write about someone you've spent time with in the last few days.

Have students generate their own topics

Variation one:

Pair students, and have the tallest member of the pair be A, the other student B. Have A and then B each take one minute to tell the best and the worst thing that has happened to them in the past two days. After they have finished this sharing, have students write about one of these happenings in their journal.

Variation two:

Students make a list of four topics they might like to write about, suggesting categories such as things that have happened to them, a sports event they were in, a favorite person. Pair students and have each talk briefly about each topic with their partner, then have each choose one topic to write about.

Use reading to stimulate writing

Select a book from the Read to Write section at the end of this module to read aloud. Focus the discussion on students' reactions to the book and to memories it triggers for them. Have them write about that reaction or memory in their journal.

YOUR ROLE

- Set a routine -- regular times when the whole class writes for ten minutes and times students can write on their own.
- Teach students the strategies above so that they will gradually be able to generate journal entries independently.
- Give positive encouragement whenever possible as students are writing. Comment on the content and ideas. When you read the journal periodically, write the student a separate note. Write on the student's Personal Data File (computer journal), since the student is free to erase your comment. Respond to a hand-written journal on a separate piece of paper.

Do Say/Write	Don't Say/Write
"You've described a scary person!"	"That's not very clear."
"Your story has the same character as the book we read."	"Can you make that a complete sentence?"

Provide frequent opportunities for students to read entries to one another in pairs, small groups, or the class as a whole. Let students decide whether or not they want to read an entry, and choose the entry.

Teach students listening strategies. Rather than have students look for problems in each others' writing, teach them to comment on what the writer was saying, on what they particularly noticed or liked, what they would like to know more about.

EXTENDED ACTIVITIES FOR WRITING AND VOCABULARY DEVELOPMENT

1. Create a Word File

Have students read through their journal entries and look for words that convey how the writer feels. Store the words in the computer. Make a class word file of "emotion words." To start the file, ask students to call out words they find in their journal, while you type them on the computer. Have students enter additional words on their own over the next week.

2. Group Words into Categories

Discuss with students how they might categorize these words into groups. They may suggest a simple happy/unhappy distinction initially, and then may notice synonyms that fall into finer categories. For example:

excited agitated nervous wild

irritated exasperated angry mad

lonely lonesome isolated

As they identify these distinctions, talk about any differences they see between the words within one category.

3. Rearrange Words

Rearrange the words in the file into the categories they have identified. Students can code words H (happy) or U (unhappy) on a printout. If your word processor has a sorting feature you can have one student code the words as the group discusses them, and then rearrange them in the file.

4. Update and Refer to the File

Have students update and refer to this file throughout the year, as they are doing other kinds of writing.

5. Print Out the File

Print out the word file once it has at least 25 entries. As a short writing assignment ask students to write a fictional story by selecting at least 5 different "emotion" words from the file.

READ TO WRITE

In the selections listed below the authors use a journal format. Use these with the class as a whole to:

- Talk about what makes a journal different from some other kinds of reading they do. They might notice that it is written in first person "I," that it is about true events, and it often conveys what the writer is thinking and feeling.
- Talk about similar events that they have experienced or know about, or similar events that they have written in their journals.
- Stimulate their own journal writing.

Suggest them as independent reading, particularly where the themes in the books are related to themes in students' own journal entries.

A. Krupnik, Lois Lowry, 1979, Houghton Mifflin

Dear Mr. Henshaw, Beverly Cleary, 1983, Morrow

Example 1

THE POWER OF TEACHER MODELING

For the previous class the teacher wrote a journal entry about learning how to read. She wrote about watching another girl get up to read and thinking, "Gee, she's a much better reader than I. She can read so much faster than I can...I still am a sort of slow reader..." She had the students read her entry from the monitor and ask questions about what she had written. She typed the questions in and wrote more for the next class. Some of the questions were: "When you said you were slow at reading, what did you mean?" "If you went up to the front of the room to read, were you embarrassed?"

Today the students are gathered around to read her expanded entry. Carey, who thinks of herself as slow and a boring writer, is intensely interested in what the teacher has written about herself.

The teacher has another student read her original entry out loud, when the reading is over, Carey asks:

C: Was that girl you?

T: Who?

C: The girl who was reading.

T: The good reader? The fast reader?

C: Yeah.

T: No, I was the one who was watching the fast reader! I'm writing about myself. I is really me Carey. (Carey is laughing in disbelief at this)

T: This is the truth! This is the truth!

The teacher reads aloud the students' questions from the previous class and has another student read aloud her response.

T: Did I answer most of them?

C: But were you embarrassed (insistent)?

T: I didn't tell you that. You want to know that!

C: Yes. (laughs)

T: I was a little nervous.

C: Were you embarrassed?

T: If I made a mistake, yes.

C: Were other kids in your class slow?

T: I don't remember. I just remember that some were better than I was.

ON-LINE CONVERSATIONS
Using the Computer as a Dialogue Journal

INTRODUCTION

Dialogue journals are interactive, written conversations carried on by student and teacher frequently and continuously over an extended period of time. Students write about a theme that interests them and the teacher responds genuinely with comments and questions, then the student takes the next turn and so forth. Dialogue journals have been used with students learning English as a second language and to help hearing-impaired children develop language skills. They have been used to improve writing and language skills in students from the elementary grades through college.

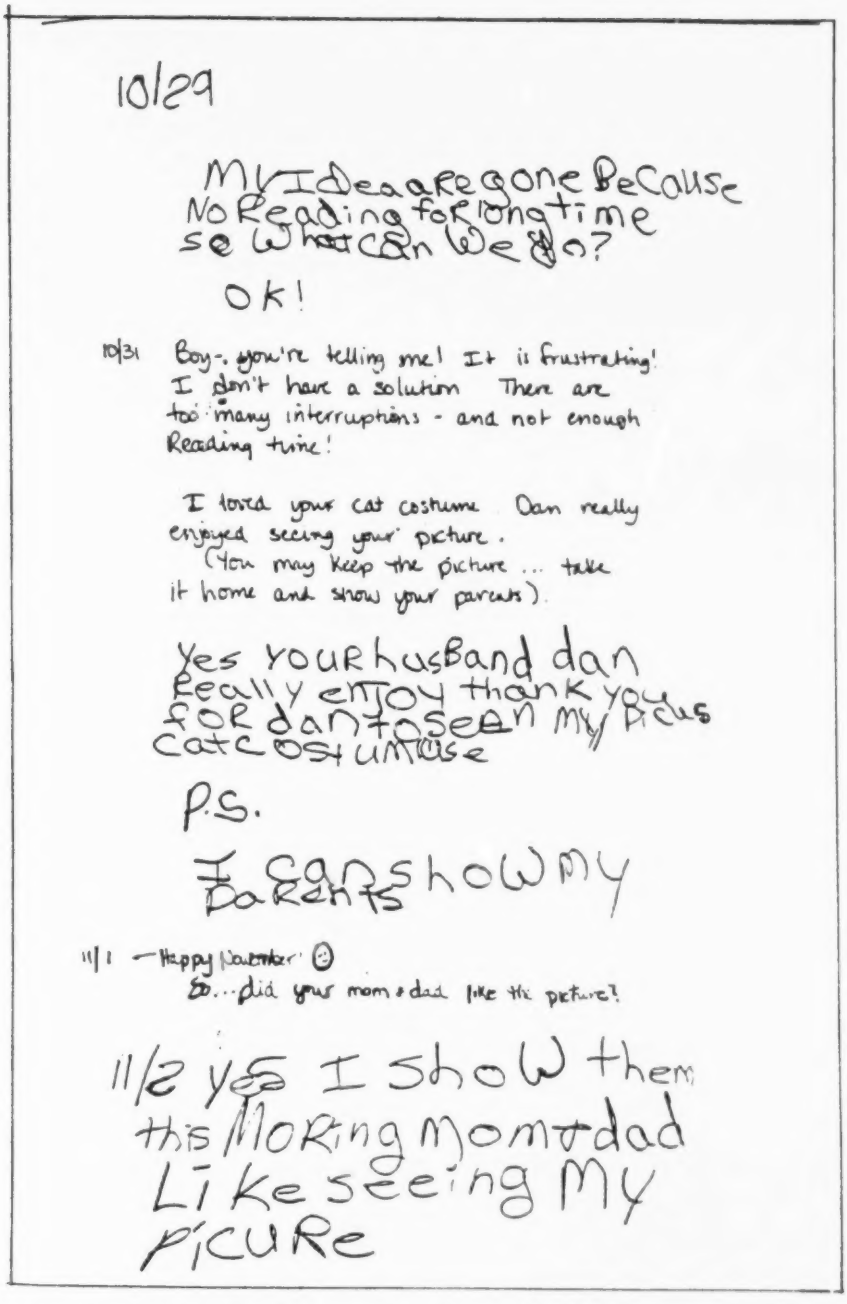
Research on dialogue journals finds that they are extremely valuable for many reasons:

- They promote an open, natural line of communication between the teacher and student because the focus is on sharing ideas rather than correcting writing.
- Teachers naturally tend to tailor their comments to the students' reading and writing ability. As a result, students are reading the appropriate amount and level of text.
- They provide a natural transition from the child's oral language ability to written language.
- They encourage the child's development of both reading and writing skills, in a natural and meaningful context.
- Every student can write a journal at his/her own level and feel successful.
- Many different kinds of writing occur within a journal--descriptions, arguments, expression of feeling, questions, narrative.

Language in general, and writing specifically, are best learned indirectly -- by using it to do something important like complain, persuade, or ask. In focusing on communicating, students have an optimal environment for learning language. The journal itself is either a bound notebook or a floppy computer disc which the student keeps in school. The journal begins by the teacher asking what students would like to write about. The teacher can suggest topics for students who want them, but the student is in charge always of the topic and direction of the journal.

See an example of a dialogue journal on the next page.

Example 1



10/29

MY Idea are gone Because No Reading for long time so What can We do?

OK!

10/31 Boy-. you're telling me! It is frustrating! I don't have a solution There are too many interruptions - and not enough Reading time!

I loved your cat costume Dan really enjoyed seeing your picture.
(You may keep the picture ... take it home and show your parents).

Yes YOUR husband dan Really enjoy thank you for dan to seen My Picus Cat costume

P.S.

I can show My Parents

11/1 — Happy Halloween! ☺
So... did your mom & dad like the picture?

11/2 yes I show them this Moring mom+dad Like seeing My PICURE

This example appears in Jana Staton, Using dialogue journals for developing thinking, reading and writing with hearing-impaired students, The Volta Review Vol. 87, No. 5 September 1985.

Objectives

Because children have a major role in determining the course of the dialogue journal, each student's outcomes may be different. Some objectives which you can expect for most students include:

- Increase fluency, i.e. rate of expressing ideas in writing.
- Respond directly to another person's ideas and questions in writing.
- Use an increasing variety of sentence types and structures.
- Use a variety of kinds of writing -- describing, arguing, listing, explaining.
- Appreciate their own ability to carry on a meaningful conversation in writing; realize that someone else is interested in what they have to say.

Key Features of Dialogue Journals

- Teacher and student write to each other; each one responds to the other's previous entries.
- The writing is ongoing, over several weeks or months.

Word Processor Skills

New skills: RETRIEVE, SAVE TEXT. Use RETURN to leave space between paragraphs. Manage access: To be developed with teachers.

HELPING STUDENTS ACQUIRE DIALOGUE WRITING SKILLS

Once students have begun keeping a Personal Data File, a dialogue journal is a natural next step. You may want to dialogue with all students or only with those with special language and writing problems.

If you start off the year with the dialogue journal, one good way to begin is to write all of your students a letter about yourself and then have them each write back a letter about themselves. Their letters will give you material to respond to.

If students are keeping a dialogue journal on the computer, you can simply retrieve their file and write your response after the students' most recent entry.

Explain to students that you will be having a conversation with them in writing, as a way to share and enjoy ideas and experiences, and as a wonderful way to get frequent writing experience.

YOUR ROLE

- Respond to students as soon as possible, the next day is ideal.
- In responding, use the same strategies that good conversation uses. Listen carefully to the student's ideas and respond genuinely. Ask questions to encourage them to elaborate their ideas. Add your personal ideas or experiences.
- Ask just one or two questions. If you ask too many, students won't respond to them.
- Encourage students to elaborate on a theme that clearly interests them. Try to keep a topic going over several writing sessions.
- Write about yourself. Students are more willing to write about themselves if you share information about yourself. If a student writes about a pet, for example, share a story about a pet you had as a child or have now.
- Comment always on the content. Never evaluate the writing.

COME TO YOUR SENSES!
Using Observation to Write Detailed Description

INTRODUCTION

We learn through our senses. Seeing, hearing, smelling, touching and tasting give us important information about our environment. Our senses are also powerful resources to us as writers for telling about our experiences to others. This module is designed to enable students to use their senses in describing important objects in their lives to others.

Beginning activities in this module focus on vocabulary development. Concrete objects provide the stimulus for eliciting adjectives that are useful to students in descriptive writing. From here, students write a description of a favorite object that they bring from home. The last phase of the activity is editing. It is important, particularly at the beginning of the year, to not overburden students with too many editing concerns. It is better to select one skill to be developed in this module and focus your editing conference on students' understanding of the importance and usefulness of that skill in writing.

Depending on their ability and personal choice, students can take their description in a number of different directions. Some will write a simple physical description. Some may include in their description reasons that the object is important to them. Still others will choose to write a fantastical story about their favorite object. We have included several examples at the end of this module to show the different types of writing that might emerge from the lesson. The examples include the initial, middle and final draft. Each student had several drafts in between. Each of these products will achieve the objectives developed for this unit. These differences will demonstrate that one of the joys of writing is that each project for each child is unique.

The word processor functions in these activities as a screen - reflecting back sensory riddles students create for each other to guess. It serves as a file for the sensory vocabulary words students amass over the course of this unit. Finally, it is a composing and editing tool, as students write descriptions of special personal objects.

Objectives

- To work cooperatively with other students in identifying descriptive words and using them to expand their writing.
- To be able to describe an object in terms of its sensory attributes.
- To focus on expanding ideas before editing.
- To become familiar with the key features of descriptive writing.

Key Features of Descriptive Writing

- Evokes mental images.
- Draws on sensory information.
- Requires specific vocabulary to enable readers to recreate the experience.

Word Processing Skills

Students will need to learn the following skills in addition to those already acquired: scroll up and down, retrieve, center, and print draft/print final.

STEP 1: TACTILE RIDDLES

In this step you will demonstrate how to write "tactile riddles." Students will then each be given a secret object and will write clues in order for others to guess their objects. Finally, they will bring in a favorite object from home, make a riddle about it, and then describe it in writing.

Before Class

Bring small objects to class in paper bags. The students will be feeling and describing these objects without being able to see them. Their descriptions will then become "riddles" for other students to guess. Some objects which are challenging and fun to describe include:

- peanuts in the shell
- pineapple
- coconut
- lightbulb
- a roll of tape
- a flower bulb
- an extension cord
- a ball of yarn
- a doorknob
- a small doll

During Class

1. Model

Choose one student to help you demonstrate this activity by being the "riddler." You will be the typist. Sit at the computer with the student beside you. Other students should be sitting close by (a large screen is ideal for this). Have the "riddler" put his/her hand in one bag and feel the object inside. Have the student describe it using only words and phrases that deal with touch. Type the student's words on the computer.

After the riddler has dictated several "tactile clues," ask the class to guess the object. Then have the "riddler" pull the object from the bag. Discussion ideas:

- Which word or phrases most aptly describe the object?
- How easy or difficult was it to guess the object, given only "tactile" clues?
- What other key words or phrases might students use if they could describe the object with their other senses, such as sight, hearing and smell?

2. Write and Guess Riddles

When students have the idea of tactile riddles, give each one a paper bag with an object inside it. Tell them to describe how it feels by writing down clues. Children do not need to write in complete sentences. They also should be encouraged to handle spelling the best they can.

When students have finished their riddles, let other students guess the object described. If they are in the lab, have each student move to the next computer to guess that riddle. They can type their guesses on the monitor, under the description, along with their initials. Let students guess at least three other descriptions. Once everyone has had the opportunity to guess, students can share their object with others.

Discussion ideas:

- What features of the object were most difficult to describe?
- What words were most descriptive and why?
- How could their other senses contribute to the description?

Assignment for Next Class

Assign students to bring an object of personal importance to the next class. Tell them to bring it in a bag, since they are going to describe it. Have the other students guess what it is.

STEP 2: OBJECT DESCRIPTIONS

Students will write words and phrases which describe their favorite object. They will form small groups to read and guess each other's writing in order to expand their descriptions. They will write the first draft of a descriptive paragraph. You will give them a strategy for reviewing their writing in terms of the key features of descriptive writing.

During Class

1. Write Clues

Tell students that today they will be able to use all their senses in order to fully describe the personal object they brought in. As with the tactile riddle, they should make a list of their object's attributes. They may also want to use similes words which compare their object to something else, such as "hard as a rock" or "oval like an egg."

Again, remind students that their ideas do not need to be expressed in complete sentences.

2. Read and Guess

Have students form pairs or small groups and take turns reading aloud their clues. Let other students guess what their object is.

If a particular object is hard to guess, let students describe how the object is used and where it could be found. These discussions will lead students to expanding their description by including more about the object's history, use and importance.

3. Write

Tell students that they will now write a description of their object in a paragraph. This time, they will need to write in complete sentences. They should work on writing down all their ideas and attend to punctuation and spelling at a later time.

Their description should include what their special object looks like and why it is important, as well as comments or stories they may want to add about it. These descriptions may be completed in one session, or may take several sessions.

Have students SAVE and PRINT their descriptions.

4. Provide a Revision Strategy

Review the key features of descriptive writing with the students. These features can be placed on a card for students to refer to after they have completed their writing. Or they can be put directly on the students' word processor discs as a prompting technique. Tell students to ask themselves the following questions as they work on their descriptions:

- Does my description help the reader know exactly what my object is like?
- For example, did I use words that tell how the object looks, feels, moves, smells, sounds? (Only some of these may be relevant).

- Did I tell the reader why this object is important to me? Where I got it? Who gave it to me?

- Are there some good stories I can tell about it?

STEP 3: EDITING CONFERENCE

Select one editing issue for students, depending on each student's needs. Students will review and correct their papers for errors on this particular skill.

EXTENDED ACTIVITIES

1. Sharpen Students' Abilities to Provide Specific Detail

Play the Potato Game. Give each student in the class a potato. Let them describe it as clearly as possible using any of their senses. Have them mark the potato to denote its owner. Place all the potatoes back together. Hand in all the descriptions. Give each student a new description (not their own). The object of the game is to read the description and find the potato that belongs to its owner.

2. Build Vocabulary

Say it with words. This independent activity builds sensory vocabulary words. Using colored paper, cut out large shapes of common fruit. You might make a large apple out of red paper, a pear out of lime green paper, etc... Ask students to fill these shapes with words which relate to that particular fruit. For example, words to describe apples might include red, luscious, delicious, yummy, sweet. These large shapes can be hung on the bulletin board as a classroom project. Whenever students are reminded of a new sensory word which relates to one of the fruits, they can write it down. This activity can be further extended with shapes associated with holidays or special events.

3. Use Delicious Details

Bring in menus or memorabilia from favorite children's restaurants, such as MacDonalds, Burger King, Dennys, Ground Round, etc... Have children write about their favorite foods describing them in vivid detail. Many children have strong preferences for one restaurant over another. For example, some children insist that Wendy's 'square' burgers are far better than Burger King's 'charcoal' burgers. Let them write about these differences and share their preferences with their peers. It is bound to be a lively and delicious discussion.

Example 1

Jennifer Lee Jan. 21, 1986

(special object: hamster)

small

golden and white in coler

black eyes

pink feet,tail,nose and ears

furry

soft

scwormy

bite when you bother him

sleeps alot

when aweak always moving

always escapes from cage

digs and makes beds

I choose my hamster because he's my favrite object and because I love him. My hamster's name is FRISKY. He has big black eyes .His fur is golden on top, white on the bottom and his feet,tail,nose and ears are pink. He has gotten out of his cage more than onece. One time I though I realy lost him because I lost him behind my bed but then Tricia found him. One day when I was sick I asked my father to go get Frisky so I could play with him. When my father got Frisky he bit my father on the finger and made it bleed.

Example 2

George January 1, 1986

(special object: toy hippo)

it is hollow
you might find them in a toy store
it is hard
its very rare
not very popular
if it were real it would live in the amazon river
if it is pushed down it pops back up again
it has big feet and head
it is has ovale shaped body
in real life it is it is very big
in real life it would live in most jungles
it only has four teeth
it eats plants
it spends most of its life in water
because of its emanse size.

the end

Example 3

THE CASE OF THE MISSING RIVER

starring HENRY HIPPO

It was a typical day in the Amazon River and we find our friend Henry cooling himself off with his friend P.J. Python. "You now P.J., I woud swear that the river is getting lower."

"Ya boss, I kind of notice that myself."

"Then why didn't you say so?"

"Well, I was kind of wrapped up."

"Oh P.J., let go of that alligator."

"Oh, all right."

"You now, I bet you this is the work of that crazy cat B.J. Bobcat."

"We must go immedetly."

Later as they slowly trugged through the swamp our heros begin to tire.

"We'll spend the night here," said Henry.

"Henry can we have supper?"

"Yes, but don't get too wrapped up in it. Have something light."

"How about an alligator?"

The next morning, Henry arose to find P.J. getting breakfast.

"Let go of that indian."

"Oh all right. That would have been a great meal."

"Oh his spear would have gotten caught in your throat."

Two days later...

"P.J.,"whispered Henry.

"What?"

"My hunch was right. Look!"

"It's him all right."

"Freeze B.J.,"said Henry sternly.

Example 3

(continued)

"You must be crazy if you think you can stop me," said B.J. cunningly.

"Get him P.J."

"All right boss."

"Arrrrrgh! Get this snake off me."

"Nice work P.J.," laughed Henry.

Now to open the dam and let the water out.

Example 4

Henry January 8, 1986

(special object: toy dog)

Soft
It's body is hairy

moves

runs a little

and sits on it's but

taste nasty

has ears

legs

barks

it's black.

My New Dog

When I woke up on Christmas Day I was so happy that I got so much toys because I thought that I didn't get any toys. I went in the living room and saw so many toys I thought that I was going to faint. The first gift I opened was a backgammon set,then the dog,then my new bike,and last my train set. I had to go to the store to get some batteries for my dog. When I got home I went right to my dog and put the batteries in it. I played with my new dog all day and the color was black. It sits when it barks and his ears are pointy. When I saw the name Florine I knew it was from my mother and I raced up to her and gave her a big hug. When I go to school I leave my dog in my closet so my little brother can't get to it. After I got him I named him Coco. I like my dog because the way he walks, barks, sits, and runs. Every day I come home from school I play with him. I said to my mother that I will not spill anything on it. But I told her that I will take the dog every where I go. But when I took my dog to the Pancake House I spilled syrup on him. When we got home I took the batteries out of him and washed the syrup off and never took him to the Pancake House again.

THE MIRACULOUS MEMORY MACHINE
Using Memories to Write Personal Narrative

INTRODUCTION

Our minds store memories without any conscious help from us, and call them back to us in unexpected times and ways. Those past experiences are a rich resource for writing. They can entertain others and help both the reader and writer better understand their own lives. To a writer, memories are treasures.

This series of assignments combines remembering, talking, reading, and writing to help students discover the power of their own memories and the satisfaction of communicating important experiences to others. The word processor is a partner in these activities. It is a "memory file" for the experiences students recall and a "clipboard" for notes made from interviewing other people about their memories. It is a composing tool and a "mirror" which reflects back written experiences so that students can read them to each other. The mind and the computer--a memory machine and a writing machine--team up to help students discover and communicate ideas and stories they didn't even know they knew.

Objectives

- To learn to tap memories for writing.
- To write about a personal experience.
- To understand the key features of personal narrative.
- To appreciate the richness of their own memories.

Key Features of Personal Narrative

- Told from the author's point of view.
- Involves a real incident in the author's life.
- Includes the author's personal reactions.
- Events usually told in sequence.

Word Processing Skills

In addition to skills used previously, students may learn the MOVE function to reorganize an initial brainstorm. Some students may be ready to learn FIND/REPLACE to highlight and change recurring problems and may use a spelling checker. Note the glossary, which explains each function and the practice exercise for acquiring skills in them (not yet developed).

STEP 1: TAPPING MEMORIES

Students will be guided through an activity which encourages them to tap their memories. They will then write about one memory of their own.

Getting Started

The following activities will help students trigger memories. One or more can be used over several days. Students can "file" memories on their personal word processor discs, and select from the file for later writing activities.

1. Read and Discuss a Book

Read a book that focuses on a writer's memories (check the 'Read to Write' section at the end of this module). This will increase students' awareness that writing is often based on an author's memories.

Discussion ideas:

- What parts of the book did you particularly remember and like?
- Why do you think that memory was important to the writer?
- What were some of the feelings connected to the writer's memories?

2. Guide a Memory Process

Have students sit quietly, without papers or books on their desks or laps. The atmosphere should be quiet. Say:

> "This is a quiet process which will bring up some of your memories. There is nothing that you have to do. Your mind will do everything for you. Just listen to the directions I give you and notice whether you think of something."

Read the following questions out loud allowing 8 - 10 seconds between questions.

- Think of a time when you were smiling.
- Think of a time when you were laughing.
- Think of a time when you were angry.
- Think of a time when you were sad.
- Think of a time when you said goodbye to someone.

- Think of a time when you lost something.
- Think of a time when someone gave you something special.
- Think of a time when you were happy.

Have students open their eyes and share memories with others. You might group the students in small "buzz groups" or share memories together in a total class group. The discussion is likely to elicit more memories.

3. Model the Memory Process

Bring in several items or 'treasures' which reflect your own personal experiences. Some examples might be: a birthday candle, a well-worn stuffed animal, a vacation picture, a sea shell.

Show these items to the students and describe a brief memory. These stories, along with the accompanying item, will make the abstract concept of past memories more concrete to students.

As students elicit memories in these various ways, help them appreciate the miraculous power of their minds to store and retrieve an endless range of experiences.

Writing and Sharing Memories

These 'getting started' activities should provide a rich storehouse of ideas for beginning to write about memories. Now let the students go to the computer and write about any memory that is particulary meaningful to them. These memories can be short or long, depending on the student. Encourage them to write down their ideas to share with others. This writing will not be revised or edited.

Have students read aloud their memory to the other students.

STEP 2: WRITING MEMORIES

Students will bring in a photograph and write a personal narrative about a special memory.

Before Class

Tell students to bring in a special photograph (you may want to assign this several days beforehand to make sure that all students have one for the writing session). These photographs can be of them, or someone they know, a specific event or time, a place or an object which they want to remember and write about.

During Class

1. Write

Have students write everything they can remember about the events in their pictures. They should not be concerned about spelling or organization at first, but should simply focus on what they want to say about the picture. They might begin to write about their picture in several ways:

- "Brainstorm" at the computer. Write down words, phrases, ideas that come to mind about the picture. These ideas can become an idea file which is printed in draft form for later reference. After they complete this brainstorm, they can use the move procedure to reorganize their story more sequentially.

- Have the student tell a teacher or another student about the picture orally. The listener can make notes of key words on the computer or paper and pencil. The writer then takes these to prompt their writing.

This writing may take one or several sessions to complete.

STEP 3: EXPANDING MEMORIES

You will discuss the key features of narrative for students. Students will expand their memories, based on these key features and additional ideas they get from reading aloud their writing to other students.

Before Class

Have hard copies of the personal narratives available for students to read aloud.

During Class

1. Present a Revision Strategy

Describe the key features of personal narrative. These questions may be placed on a chart to be reviewed and remembered.

Have students review their story using these questions to help them clarify and expand their writing.

- Is my story true? Did it really happen to me?
- Did I use "I" in telling about the experience?
- Did I tell how I felt about the experience?
- Did I tell things in order?

2. Share and Discuss

Have students take turns reading their writing aloud in a small group. Encourage the writer to say something about his/her writing, and to ask for specific help from his/her group. For example, he/she may ask for suggestions as to how to end the description, or whether the story is clear. The discussion should focus on the writer's needs. Encourage the listeners to think and comment about:

- What they enjoyed about the story.
- What else they would like to know about the person or event being described.
- Whether it is clear what happened, when it happened, and to whom it happened. Narratives require that students describe a sequence of events in coherent order, and clearly refer to the actors.

3. Revise

Have students expand their descriptions, drawing on the comments and suggestions from the discussion, and on changes and additions that were further brought to mind.

STEP 4: EDITING

Students will focus on one issue in editing their work, and gain practice and understanding of at least one "writing rule."

Before Class

Read through students' hard copies to identify the appropriate editing issue for each student.

During Class

1. Edit

Explain that students will be doing what all writers do when they have said what they want to say. Go back and make certain they have followed the 'rules' for clear writing. Editing can be done independently or with another student.

- Editing. Give each student the one editing task which is most appropriate for them. For some students it will continue to be complete sentences, as in the previous sensory writing exercise. For others, it may be clear reference and appropriate pronoun use. FIND/REPLACE is appropriate at this point if students identify some recurring problems.

- Peer editing. Students can assist each other in editing. For example, pair a student with strong spelling skills with a student with weak skills, or a student who correctly punctuates and capitalizes sentences with a student who is inconsistent in this area.

When students have completed their one editing task, and have identified and corrected misspellings, they should save and print their text.

STEP 5: PUBLISHING MEMORIES

Before Class

1. Teacher Edit

Correct any additional misspellings in students' work, so that their final copies will reinforce correct spelling.

2. Prepare Materials

Have colored construction paper available for students to mount their photo and personal narrative.

During Class

1. Title

Have students give their work a title and make any final changes. Save and print the final copies.

2. Display Their Work

Mount the photo and text on colored construction paper.

3. Share Their Work with Others

Mount these stories on the bulletin board for 'guests' to read and enjoy. Focus on acknowledging students' accomplishments. Appreciate how they have worked with their own miraculous memory machines and the word processor to recreate memories for themselves and others to enjoy.

Let students read and share these stories. Put these stories together to form a class history book. You may find that when a class is writing personal anecdotes, one students' story can trigger similar stories from other students. This is a powerful result because it shows that everyone has meaningful experiences to share, and that there are common themes with endless variations in students' experiences.

EXTENDED ACTIVITIES

1. Another Point of View

Let students interview a person who was connected to their personal narrative. This might be their mother or father, a relative or a friend--anyone who might have been involved in the same experience. Ask them to tell about the incident from that person's point of view. Encourage them to take notes as they interview the person.

Students can write a paragraph including this new information from a different point of view. This is an ideal activity for a student who is ready for a more challenging task.

2. Stream of Consciousness

For 10 minutes, have students write down everything that comes into their heads, using the first words that occur to them, without concern for spelling, grammar, form, and continuity. This should be a fast note-taking to get down as many ideas as they can regarding how they think, feel, and sense. Save these ideas. They can be used for generating new topics to write about later on.

3. A Class Memory

Have students write about a particular incident that happened this year. It might be a field trip, a science experiment, a school play, any experience that seemed to be especially interesting to all the children.

READ TO WRITE

Brown, Myra. First Night Away From Home. New York: Franklin Watts, 1960.

Viorst, Judith. The Tenth Good Thing About Barney. New York: Atheneum, 1971.

Yashima, Taro. The Wishing Tree. New York: Viking Press, 1958.

Zolotow, Charlotte. My Grandson Lew. New York: Harper and Row, 1974.

FROM TALKING TO FICTION
Using Dialogue to Write Stories

INTRODUCTION

Pretending to be the parent in the dress-up corner, talking for a favorite stuffed animal or making a toy car roar across the floor -- these are a student's first opportunities to create fiction. Students naturally take on and experiment with different voices and roles as a way to learn more about the world, what is and what could be. It is especially natural for people to experiment through speech, since it is a primary means of communication that conveys facts and feelings.

As writers, students need to listen to what people say and learn what it reveals to an audience about the speaker. This module is designed to help students become more aware of dialogue in their reading and of the goals for dialogue in their own writing. Beginning activities in this module focus on listening to dialogue, both their own and other writers, and discussing what kinds of information they can learn about the speaker.

Students experiment with writing dialogue in pairs and independently, develop characters and write stories. Students can use their own skills to produce internal monologues, write in other curriculum areas, or create a comic, radio or stage plays.

Objectives

- To work cooperatively with other students in generating dialogues that tell a story.
- To be able to use imagination and memory to develop voices for different characters.
- To focus on choosing and organizing words that convey a character's "point of view."

Key Features of Dialogue Writing

- Helps tell the facts of a story.
- Conveys the inner thoughts and feelings of characters.
- Helps a story to be more active and alive.

Word Processing Skills

RETURN key, using " " marks

STEP 1: CONVERSATIONS

In this lesson students will work in pairs as they talk to each other through the computer. This activity may work better after a weekend break when students may naturally have a lot to say to each other.

During Class

At the beginning of class tell students that today they are going to spend time in class talking -- through the computer. Working in pairs at one computer, or on networked computers, students will write and read from the computer screen as their conversations evolve. Remind students that these are public conversations. Also, tell them not to worry about spelling or proofreading skills.

You may want to post these rules on the board:

RULES

1. Take turns. Always hit RETURN to let your partner know you are done.
2. "Talk" only using the computer.
3. Have a lively talk -- if you can, try to learn something new about your partner.

Participate if you can, especially if there's an extra student. If not, maybe you can enlist another teacher for this exercise. Bring the exercise to a close with a sharing time. Discuss what kinds of information people learn through dialogue.

Discussion ideas:

- What did you learn about your partner in your conversation?
- What facts did your partner tell you?
- What clues did your partner give you about what he/she was thinking or feeling?
- Did you get confused during your conversation? What did you do to help yourself understand better?
- How is written conversation different than talking to each other? How do you feel when you are reading a book -- do you think hearing the people talk is helpful or not?

STEP 2: FINDING A VOICE

Students listen to several pieces with dialogues, and discuss what can be learned about the characters through what they said and how they said it. Then students create characters from inanimate objects, and practice writing dialogues in pairs.

During Class

1. At the beginning of class, introduce the word DIALOGUE. Explain that dialogue is one of the ways a writer:

- Lets a reader know what is happening or about to happen in the story (TELLS FACTS)
- Lets the reader know what is going on inside a character's head (TELLS THOUGHTS AND FEELINGS)
- Helps the characters in a story seem more active and alive

Choosing from available sources read short selections of dialogue. Choose selections with a variety of characters and a range of emotions. Ask students what they can learn about the characters through what they say, and how they say it. Point out that writers can't rely on how the person's voice sounds -- they are limited to the printed word to convey emotions.

2. As a class, brainstorm a list of things that are found together in the world: pencil/eraser, cup/saucer, pair of mittens, car/spare tire. Tell students, working in pairs, to choose one set from the list, or to think of their own. First, each student will write for ten to fifteen minutes on their own, telling everything they can imagine about their object. This is a note-taking exercise in which students tell all they can about their characters as they move toward giving their inanimate objects a voice.

List the following prompts on the board or their computer screens:

- What does your character look like?
- What does your character do?
- What makes your character happy, sad, mad, frustrated?
- Tell about a day in your character's life.
- What is your character thinking, feeling right now?

You may want to model this exercise for students by choosing an object yourself. "Charlotte Chalk writes all day. She loves math class, nods off in history, hates dust, worries about being a little shorter every day. Wishes she could go out to the hopscotch game she sees out window. Young, friendly and likes to help others."

3. After the note-taking is done, tell the students to get back into pairs and write a dialogue that these two could have. Remind the students to stay in character. For pairs that have trouble getting started, help them generate a problem or disagreement their two characters share, and tell them to focus the dialogue on trying to solve that problem. For example, the spare tire is getting bored bumping around in the trunk, while the every-day tire is getting worn out. What should they do?

4. When students are done, they should save their sketches and dialogues. Students, working in small groups, read their dialogues and ask for feedback. You may want to model a conference with one student pair before beginning. One method is to have one of the authors read the dialogue to the group. Afterwards, students tell the authors what facts of the story they learned through the dialogue, and what they learned about the characters from what they said, and how they said it.

(Note: Teachers may want to experiment more with dialogue before writing stories - see Extensions at end of this module.)

STEP 3: WRITING A STORY WITH DIALOGUE

Each student will either invent or remember two characters. They will write a short note-taking piece about each character, devise a reason or problem for their characters to meet, and write a dialogue-story about their meeting. You may want to focus this activity around another class, social studies or science unit, having each student pick characters from a particular time, mythology or place.

During Class

1. Students each choose two characters and do a brief note-taking exercise about both characters, using the questions from the previous exercise if they need to. Remind the students that the note-taking is for them, to help them get to know their characters a little better before they write. Ask the students to decide on a problem or reason for their characters to meet. Some students may want to continue to work in pairs, which is, of course, up to the teacher's discretion.

2. Tell students to write the first draft of a dialogue. The goals are to tell a story through the dialogue, and to keep in character as they tell their story. Remind students to write down all their ideas and attend to punctuation and spelling at a later time. Have students SAVE and PRINT their descriptions.

3. Provide a revision strategy. When students are done writing first drafts, they can read their drafts to a whole class or small group. Once again, students can respond to:

- What happened in the story?
- What did you learn about the character through what they said and how they said it?

- What did you like about the story?
- Do you have any questions about the story?

The teacher, or an assigned note-taker, can write down the audience's responses for the student to refer to when revising. During a writing conference, it is helpful for the audience to keep their comments short and positive. The writer may be encouraged to ask for help on a part s/he found particularly confusing or hard to write. At the end of the conference, the teacher can ask the student what s/he plans to do next with this story as a way to help focus on the next step in the writing process.

4. Edit for content and readability.

5. For project suggestions, see "Moving to Narration," Number Four in Extended Activities.

EXTENDED ACTIVITIES

1. IMPROVISATION: Role-playing, even pantomime, helps students practice slipping into other characters, as well as sharpens the audience's powers of observation. You, or the students, give roles to students to act out. These roles can be simple role-plays, such as waiting for a bus when you are late to school, or can be more complicated premises, such as a child trying to talk the landlord into letting her keep her pet boa constrictor.

This improvisation can be done as skits in front of the class, and can be done in pairs at the computer. The goal of this is to have fun with language and 'acting', not to produce polished pieces. One twist is to have students freeze, and then switch roles in mid-dialogue. This would also be a time to reinforce and expand on the idea of staying in character.

2. INTERNAL MONOLOGUES: Students choose characters from their reading, class units, or their imagination and elaborate the internal monologue of their character. For example, what was George Washington thinking at Valley Forge? How does the equal sign feel about its job? These assignments can help students integrate their learning through writing and further experiment with writing from a different point of view.

3. PLAYING ON EMOTIONS: In this exercise, students first practice saying the same stock phrases, but using different emotions. The way a wistful, newly-retired pilot says "I'll never do that again" is different from the way a child says it when caught licking the icing off Grandpa's birthday cake. Point out that a writer can't rely on the sound of the speaker's voice to convey emotion. Then try, either as a class or in small groups, to generate a list of other ways that an author can let the audience know the speaker's intent. You may want to keep a list of vocabulary for the class that they can refer to when writing, especially verbs, adverbs and similes -- for example, replied, whispered, said reluctantly, barked like a terrier, growled. Experiment aloud and in writing with the phrases below. Try conveying each sentence in as many different ways as your class can. Invent your own multi-purpose phrases.

I don't believe it.

At last, it's over.

What did you say your name was?

Where is the key?

I won't do that again.

I don't know what you mean.

4. MOVING TO NARRATION: Writing formal narration is a complicated, multi-step process. Dialogue needs to be paired with narration to give the "whole story." Some projects that use dialogue-writing skills and that provide a bridge to writing narration are:

- Writing comics that have dialogue but use pictures to set the scene and provide information about what the characters are doing.
- Writing radio plays that incorporate dialogue and the use of voice and sound effects to tell a story.
- Writing plays that use dialogue and stage settings and directions to tell a story.

Finally, students tend to try to use dialogue exclusively in some stages of writing. At some point, students need to be encouraged to look for crucial points in their writing when dialogue is the most useful. They should also be encouraged to read sections of their writing, and to sum up extraneous dialogue. For example, in a story about a safari, the conversation at home while they are packing for the trip may not be important enough to include. Students need to look for sections where dialogue helps move the story along.

FANTASTIC FABLES
Writing a Story that Illustrates a Point

INTRODUCTION

Fables are a natural bridge between pure story (once-upon-a-time) and writing to make a specific point. They are brief, fictitious stories designed to make a specific generalization. Fables invite children to savor events in order to draw conclusions. Over many generations fables have been popular with children, and available to them through a rich literature stemming from Aesop.

The fable has two parts: the narrative and the statement that is designed to teach a lesson. In most fables, one or more of the main characters is an animal, plant or thing that talks and acts like a human being. They include familiar themes such as never being satisfied, being false to others, and understanding people's true characters. Reading and writing fables offer students opportunities to explore age old themes and new ideas, blending together purposeful writing and meaningful communication.

The word processor is used in these lessons to work collaboratively with other students, and to publish students' fables in a book for all the class and other classrooms to enjoy.

Objectives

- Infer an underlying generalization from a pointed piece of writing.
- Write an epigrammatic statement.
- Write a short story that illustrates a specific point.
- Practice using animals to express human emotions (i.e., allegory) in stories.

Key Features of Fables

- Includes both a narrative and an epigrammatic statement.
- Tells a story to illustrate an explicit general point.
- Usually involves animals that talk and act as human beings.
- Brief, usually one paragraph in length.

Word Processing Features

Children will continue to use the word processing functions they have learned in previous modules.

STEP 1: READING FABLES

You will read several fables to the children, and together you will explore their key features. You will then read the narrative portion of another fable, having students write epigrams for it.

During Class

1. Read Several Fables

Read a few short familiar fables to the students (select from the 'Read to Write' section at the end of the unit or use the example included at the end of the module). This will refresh students' memories of this style of writing.

Discussion ideas:

- What are fables trying to do? (teach a lesson)
- How do they do it? (by telling a story, then writing a general statement)
- What are some of the common devices these stories use? (animals that talk to express human feelings)

2. Writing Epigrams

Give students several fables, leaving out the final epigrammatic statement. You may have these fables on disc for students to read at the computer, read them aloud to the students, or have them xeroxed on sheets. Several fables are included with this module.

Ask them all to read the same fable and then write an epigram--a general statement which teaches a lesson. Print these out, including the fable and students' original epigrams.

3. Share Epigrams

Form 'buzz groups' and share each other's epigrams. Children are most likely to write different 'lessons' to the narratives. Explore these differences.

Put several epigrams on the board from student examples.

Summary points:

- Epigrams should be short, pointed statements.
- They should represent the main point of the story.
- They may be inferred from the story.

4. Write a Narrative

Tell the students to think of a "lesson" or point about what people should or shouldn't do. Have them go to the computer and write a story that illustrates this point. Tell them, DO NOT WRITE AN EPIGRAM. These narratives can be prose or verse, depending on the student. This writing will not be revised or edited.

Have students trade computers. Each student should read their friend's narrative and type an appropriate epigram on the computer. Trade back. Discuss why they were right or not.

Discussion ideas:

- Why were some of the epigrams on target and others not (perhaps the story wasn't 'pointed' enough).
- Did the story teach a lesson?
- Was that lesson important?
- Did the animal characters have human emotions?

STEP 2: WRITING FABLES

Students will write a fable on the computer and revise it on the basis of peer feedback.

<u>During Class</u>

1. Write

Have students write a fable. Have them keep in mind the key features of a narrative. This writing may take one or several sessions to complete.

2. Conference with Peers

Have students take turns reading their writing to each other. Encourage the listener to comment on:

- What they enjoyed about the fable.
- Whether it was clear what happened, when it happened and why.
- Whether the narrative and epigram seem to connect. Fables require that the story point to the epigram.

3. Revise

Have students revise their stories, drawing on the comments, and any additional clarifications that were brought out by the discussion.

STEP 3: EDIT AND PUBLISH FABLES

Following the basic steps in the previous modules, students will edit their writing for mechanics and spelling. They will share these fables with others, and publish a book of fables to be shared with other classes as well.

1. Student Edit

Ask students to proofread their writing for editing details, including mechanics and spelling. Be sure to note the specific types of editing changes they make for your future conferencing and mini-lessons.

2. Teacher Edit

Correct any additional misspellings in students' work, so that their final copies reflect correct spelling. (This step is most appropriately done outside of classroom instructional time.)

3. Title

Have students use the CENTER procedure to write a title for their fable. Make any final corrections. Save and print a final copy.

4. Share with Others

Fables are fun to share with others. Have students read their fable aloud, pausing before the epigram is read. This will encourage prediction, surprise and participation in reading.

5. Publish a Book

Make a class book by binding these fables together. Create a good title! After first enjoying them in the classroom, loan this book out to other classes. Word processing allows this book to look especially professional. Teachings from _____ Fables will become a school best seller!

EXTENDED ACTIVITIES

1. Writing about Pictures

A picture stimulus can provide many opportunities for writing fiction. Have students make up a story by placing themselves in a scene depicted in a magazine advertisement, or choosing their favorite pictures to write from.

2. Write a Parable

A parable is a similarly pointed short story only without a **stated** moral. A parable demands that the reader make the generalization. Have fun first by reading parables and exploring their multiple interpretations; then try writing parables for others to enjoy.

3. Write a Joke or a Pun

Children love to laugh. Another folk tradition is the joke or pun. Good jokes can be written down and shared orally with the class. The class might compile a book of favorites, a welcomed addition to the classroom library.

READ TO WRITE

Aesop's Fables, A selection, illustrated by Gaynor Chapman. New York:Atheneum, 1971.

Aesop's Fables, illustrated by Heidi Holder. New York: Viking Press, 1981.

The Lion and the Mouse. Pictures by Edward Young. New York: Doubleday, 1981.

The Boy Who Cried Wolf, retold by Katherine Evans. New York: Whitman, 1960.

The Town Mouse and the Country Mouse. Adapted and illustrated by Paul Galdone. New York: McGraw-Hill, 1971.

The Lion and the Rat. Jean de La Fontaine. Illustrated by Brian Wildsmith. New York: Franklin Watts, 1963.

Fables. Written and illustrated by Arnold Lobel. New York: Harper and Row, 1980.

Example 1

THE HARE AND THE TORTOISE

A Hare one day was making fun of a Tortoise for being so slow upon his feet. "Wait a bit," said the Tortoise; "I'll run a race with you, and I'll wager that I win." "Oh, well," replied the Hare, who was much amused at the idea, "let's try and see"; and it was soon agreed that the fox should set a course for them, and be the judge. When the time came both started off together, but the Hare was soon so far ahead that he thought he might as well have a rest: so down he lay and fell fast asleep. Meanwhile the Tortoise kept plodding on, and in time reached the goal. At last the Hare woke with a start, and dashed on at his fastest, but only to find that the Tortoise has already won the race.

Slow and steady wins the race.

From Aesop's Fables, A Selection, illustrated by Gaynor Chapman. New York: Atheneum, 1971.

Example 2

THE MICE AND THE WEASALS

There was war between the Mice and the Weasals, in which the Mice always got the worst of it, numbers of them being killed and eaten by the Weasals. So they called a council of war, in which an old Mouse got up and said, "It's no wonder we are always beaten, for we have no generals to plan our battles and direct our movement in the field." Acting on his advice, they chose the biggest Mice to be their leaders, and these, in order to be distinguished from the rank and file, provided themselves with helmets bearing large plumes of straw. They then led out the Mice to battle, confident of victory: but they were defeated as usual, and were soon scampering as fast as they could to their holes. All made their way to safety without difficulty except the leaders, who were so hampered by the badges of their rank that they could not get into their holes, and fell easily victims to their pursuers.

Greatness carries its own penalties.

From Aesop's Fables, A Selection, illustrated by Gaynor Chapman. New York: Atheneum, 1971.

Example 3

THE FOX AND THE GOAT

A fox fell into a well and was unable to get out again. By and by a thirsty Goat came by, and seeing the Fox in the well asked him if the water was good. "Good?" said the Fox, "It's the best water I ever tasted in all my life. Come down and try it yourself." The Goat thought of nothing but the prospect of quenching his thirst, and jumped in at once. When he had had enough to drink, he looked about, like the Fox, for some way of getting out, but could find none. Presently the Fox said, "I have an idea. You stand on your hind legs, and plant your forelegs firmly against the side of the well, and then I'll climb on to your back, and, from there, by stepping on your horns, I can get out. And when I'm out, I'll help you out too." The Goat did as he was requested, and the Fox climbed on to his back and so out of the well; and then he coolly walked away. The Goat called loudly after him and reminded him of his promise to help him out: but the Fox merely turned and said, "If you had as much sense in your head as you have hair in your beard you wouldn't have got into the well without making certain that you could get out again."

Look before you leap.

From Aesop's Fables, A Selection, illustrated by Gaynor Chapman. New York: Atheneum, 1971.

SPECIAL LIVES
Using Interviewing to Tell Other People's Stories

INTRODUCTION

All around us, in our families and our neighborhoods, there are people with rich lives and wonderful stories to tell. People who are older than us can make other times and places vivid with their storytelling. Students who are nine, ten and eleven are intrigued by the childhoods of older people particularly when they hear that history firsthand. In learning the specific, personal history of someone older they learn about American history and culture in a very natural way.

In this module each student will be talking with an older person in their family or community to learn about that person's childhood and share it with their classmates. They can choose a parent, a grandparent, a special aunt or uncle, a family friend, or a neighbor. They will prepare some questions to use in interviewing them, have an informal conversation and then write about their experience of talking about that person, and what they learned.

Students will use the word processor to file the questions they think of as a class and then to print out two or three questions that are appropriate for their special person. They can write about their conversation and then edit it. The word processor can print out professional looking final "histories" for publishing in a class book.

Objectives

- To learn basic interviewing techniques
- To learn simple note-taking skills
- To use another person's experience as a subject for writing
- To develop confidence in their ability to draw useful and interesting information from other people

Key Features of Personal History

- It tells true stories about someone's life
- Stories can be told in the person's own words
- Childhood stories are often an important part of the history

Word Processing Skills

Children will continue to use the word processing functions they have learned in previous modules.

STEP 1: LEARNING ABOUT INTERVIEWING

Students will learn interviewing skills by first observing the teacher in an interview and then interviewing another student themselves.

During Class

1. Demonstrate an Interview

Choose a student to demonstrate interviewing with you. First ask him/her questions in a very informal way, drawing out what he/she is like, special interests, funny stories and experiences in school.

Then have the student interview you, asking questions to learn what your life was like as a child. Ask the rest of the class to jot down one or two words at a time to help them remember important points.

After the interview, ask students to use their notes to talk about what they remembered. Point out that very few words, usually nouns and verbs are needed in order to recall the interview.

2. Peer Interviewing

Tell students that they will now interview each other and then tell the class some of the interesting things they learned. Divide the class into groups of four to six students. Within those groups, have students pair up. Each student should take approximately five minutes to find out as much as they can about the other student. Suggest some questions to help them get started, for example, Where were you born? How many brothers and sisters do you have? What do you love to do most? What is your favorite food? What is a funny story about you?

Have students write down just key words to help them remember what the other student said.

When students are finished interviewing, have them stay in the small group and tell the rest of the group about the person they interviewed. Have them recall which of their questions elicited the richest answers.

Assignment for the Next Class

Ask students to think of a special adult in their lives that they would like to find out more about. The person can be someone in their family -- a parent, grandparent, or special aunt or uncle -- a family friend, a neighbor, or a teacher. Tell them they will be planning an interview with that person in the next class.

STEP 2: PLANNING THE INTERVIEW

Students will talk about special people in their lives, and develop a pool of questions which would help them learn more about the people they are going to interview. Each student will select two or three questions for his/her interview.

During Class

1. Thinking of Questions

What do they already know about the person they have chosen to interview? What else would be interesting to know? Have students generate questions that would be interesting to ask an older person to learn about their childhood. Type the questions on the word processor.

Emphasize that they will be having a very relaxed conversation with the person, and that having just two or three questions will help keep the conversation going.

Some good questions:

When you were my age, where did you go to school, and what was it like?

What were you like?

What rules did your family have? Were there things you wanted to do that you couldn't? What?

What did you like to do best when you weren't in school?

Are there any funny stories about your childhood that you would like to tell me?

Read aloud "Grampa Henry and the Bear" as an example of a story that one student wrote after asking her grandfather to tell her a true story about himself as a boy.

2. Finish Interviews

Have students select and type out the two or three questions they want to ask in their interview.

3. Discuss Interviewing

Discuss "Tips for Good Interviewing" on the next page.

Assignment for the Next Class

Have students carry out their interviews over the next week.

TIPS FOR GOOD INTERVIEWING

- Ask the person if you can interview them and tell them why you would like to do it.

  > "We are doing a project in school about interesting lives. May I ask you some questions about your life? Especially about what it was like when you were my age?

- Set a convenient time and allow for at least twenty minutes.

- Bring two or three questions with you to get the conversation started.

- Ask one question and then LISTEN. Often one question will easily get people started talking.

- When the person says something that is interesting, ask them to say more about it. This is called probing.

- Jot down one or two words to remind you of the stories or points you want to be sure to remember.

- When you think the interview is over, thank the person before you say goodbye.

- Right after the interview, sit down in a quiet place and write down everything that you remember from the interview.

STEP 3: WRITING UP THE INTERVIEW

Students will use their notes to write up the interview. You will give them some prompting questions to help them expand and revise their writing.

During Class

1. Write an introduction

Have students write about the interview itself while it is fresh -- how it went, what was most interesting, and their impressions of the person. This can constitute the "introduction" to their history.

2. Discuss

Pair students, to read what they have written and talk about what parts of the person's life they are going to include in their history.

3. Write the history

Have students use their notes to write their history. Students may take several class sessions to complete their writing. Print out their introduction and history when they are finished.

4. Expand/revise

When students have written a first draft the questions below may stimulate expansion and revision.

QUESTIONS FOR STUDENTS

- In looking back over your notes, are there any more stories or details you want to include?
- Did you include how they felt about the experiences you wrote about?
- Did you tell what their life was like when they were your age?

STEP 4: EDITING AND PUBLISHING

Students will prepare their "histories" for publishing in a class book of "Special Lives" by editing and printing out a final copy.

Before Class

Read students' histories to identify what editing skills they need at this point. Group students' papers according to the editing problems, and select mini-lessons appropriate to the major skill needs in the class. On each paper write the editing skill that the student is to work on that day.

During Class

1. Mini-lesson/Skill Practice

Organize students into groups to do skill practice on the editing skills you have selected.

2. Skill Application

Have students edit on their print-outs, applying the editing skills they have just practiced. When you have checked their editing, they can make revisions on the computer. Use the computer editing approach that is most appropriate for the student (Teacher types/ peer types/ author types).

3. Publish "Special Lives"

Compile the final histories into a book, to be used in that classroom and loaned to other classes. Have students design a sturdy cover.

GRAMPA HENRY AND THE BEAR
As told to Antonia

Once upon a time when Henry (that's me) was a young man he went with his friends on a long camping trip and on the camping trip he went to a park called Yellowstone Park. And in Yellowstone Park there are some bears, and the bears come around the campgrounds and they want people to feed them. Some people feed them and some people don't. But they really shouldn't because bears can be kind of fierce and might hurt them.

Anyway, we looked at the bears and then we found a camping place. We took all the groceries out of our car and we had them in tin boxes. We had our supper and then we put the leftover food in the tin boxes on the picnic table. And then because it was getting dark and time to go to bed we put our sleeping bags on the ground beside the car, beside the picnic table. And we..

Didn't you have a tent?

We weren't in a tent, no. We were outdoors. We could look up and see the bright stars shining. We could hear the wind whistling in the trees and we could hear little night birds go "whoo whoo." That's the way it was. It was so pleasant and nice. And so we went to sleep. I was having such a good sleep and suddenly in the middle of the night I heard a bing, bang bom and all of a sudden I woke up and there was something heavy on me. Ohhhh. I opened up my eyes and what do you think?

There was a bear sitting on my chest! A big black bear! And what do you think Grampa Henry said?

OHHHHH! (Antonia)

And what do you think the bear said? RRRRRRRFFFF!

And the bear scampered off that way and I scampered off that way. And so the bear ran away. But then the next morning we found all those tin boxes full of food were dumped over and scattered all over the place. They had run away with a big piece of bacon and a loaf of bread and we had to find more food before we could have some more picnics.

And that was the end of the bear story. And the lesson is, don't leave your food on picnic tables when there are bears around. And be careful where you sleep!

"HOW TO MAKE....."
Writing Directions for How to Make and Do Things

INTRODUCTION

Giving directions is an excellent way to engage children in purposeful writing. Directions require that the sender be specific and that the receiver concentrate. They give children an opportunity for immediate feedback on whether they have really communicated what they intended.

Directions are a practical kind of writing that helps children clarify their ideas. Giving directions encourages children to think carefully about their audience, and not to assume information or viewpoints that the receiver may not have.

The word processor can help students compose and then revise their directions as they become more aware of their audience's reactions. Revised after feedback, these "How to make..." papers can be printed together as a class book, perfect reading for vacations or summer doldrums when there is 'nothing to do.'

Objectives

- Write a set of directions for making or doing something
- Consider the audience's point of view
- Develop specific vocabulary for giving directions
- Read and follow directions from another student's writing
- Develop a sense of audience through feedback from other students
- Enjoy and learn from each other how to make things

Key Features of Written Directions

- Clear and specific
- Written in sequence
- Assume no prior knowledge of the subject on the part of the audience
- Can actually be carried out

Word Processing Skills

Children will continue to use the word processing features they have learned in previous modules.

STEP 1: GIVING ORAL DIRECTIONS

Children will play a game that requires that they give directions orally. This will introduce them to the importance of being specific in giving directions, and give them some appropriate vocabulary to use. You will describe key features of good directions, then students will write directions for the game they have just played.

Before class

Make 3 sets of two identical puzzles. A simple method is to paste a picture on a piece of oaktag, and cut it into large geometric shapes. You may xerox and cut apart the drawings included at the end of this module or use pictures of your own.

During class

1. Play the puzzle game

Ask two children to volunteer. Have them sit back to back, and ask the other students to sit around them in a circle. One of the students has a completed puzzle on the desk; the other, only unassembled pieces. The student with the completed puzzle is the 'sender'; the other student is the 'receiver.'

The sender's job is to help the receiver assemble the puzzle by giving verbal directions. Since the sender and receiver are back to back and can't see each other, they must rely on words, not gestures. For example, the sender might say, "Look for a piece with a blue balloon on it. Place that at the top of your desk." The receiver cannot ask questions but must follow the sender's instructions.

After the game, let the group discuss what they saw.
Discussion ideas:

- Why were some directions clearer than others?
- Which words were particularly helpful to the sender?

Choose two new students to play the game using a different puzzle. Have the first two players become part of the audience. From the discussion that follows each game, write reminders and vocabulary words. For example,

- Use shape words in describing puzzle pieces
- Use compass points in explaining location

2. Write

This writing will not be revised or edited. It is for practice only. Let students go to the computer. Ask them to write a set of directions on how to play the puzzle game. This writing will help you analyze children's needs in direction writing.

STEP 2: LEARNING HOW TO WRITE DIRECTIONS

This step is designed to introduce students to writing directions. You will demonstrate an activity, then work with the class to write a set of directions for that activity.

During Class

1. Model how to write directions

Choose an activity to demonstrate, such as:

- Cooking. This can be as simple as making a peanut butter and jelly sandwich, or a healthy snack.
- Making one of the puzzles that was used in the game.
- Showing students how to make a basic origami (paper-folding) creature.

After completing the demonstration, sit at the computer (a large screen is ideal for this group brainstorm). Ask students to retell you the directions for the activity. Write the directions in whatever order students say, then note where they leave information out and ask students to improve the order or specificity. The computer is particularly useful for inserting and moving here. Discuss these conclusions:

- Give the steps needed
- Use clear and specific vocabulary
- Don't assume that your audience has prior knowledge of how to go about doing an activity
- Write directions in list form, to allow readers to read quickly and accurately

Anticipating the next class

Ask students to think of something they know how to make from common materials. It could include cooking recipes, a wacky invention, a board or a card game. They will write a set of directions for this activity during the next class. They may generate a list of possibile activities and you can help them select one that is most appropriate for this writing activity.

STEP 3: WRITING DIRECTIONS

Students will write a set of directions on how to make something, then revise and edit their writing. They will exchange papers with another student and follow the directions as homework.

During Class

1. Write directions

Have students go to the computer and write a set of directions for their game, recipe or invention. Remind them of the key features of writing directions.

2. Revise

Together in pairs or in small groups, revise the directions. Have students use this strategy:

- One student reads his/her directions aloud to the group.
- The listeners respond, to help clarify the directions.
- The writer answers the questions, making notes on the print draft.

When all the students have read their directions, let them go back to the computer to make additional revisions.

4. Have an editing conference

Using a similar strategy as in other modules, hold a conference with students on spelling and mechanics, selecting the editing focus most appropriate for students at this point. Have them create a title, then print a final copy of their directions.

Homework

Have students exchange papers with each other. Their homework is to follow the directions, and bring to school what they have made.* Any problems or uncertainties about the directions should be noted by the student on the paper, which will be returned to its author.

*You might give students several days to fulfill this assignment.

STEP 4: SHARING AND PUBLISHING

Students will share and publish their writing in a book titled, "Activities for a Rainy Day."

During Class

1. Share

Let each student share their homework assignment with the class. This activity should provide for lively fun and discussion, for there may be many 'adaptations' in students' products. In addition, students will have stories to tell about unforeseen situations for which the directions did not take into account.

2. Revise

Let students go back to the computer and revise their directions if necessary.

3. Publish

Print final copies of all directions. Publish them in a book, "Activities for a Rainy Day" for all students to enjoy.

EXTENDED ACTIVITIES

1. Write travel directions.

Have students write directions for getting from the school to their home. Maps are not allowed in this activity; rather, let students pretend that these directions are to be read over the phone. Let them exchange directions with classmates for visiting on weekends or vacations.

2. You're the expert!

Everyone is an expert at some activity. It might be skateboarding, baby-sitting, or basketball. Encourage children to write directions for becoming an expert in their favorite activity. You might suggest the following ideas to guide their writing:

- What activity are you very good at doing? Describe some of your special abilities.
- How would you recommend getting started in the activity? For example, if you are an expert skateboarding star, how did you learn? How did you protect yourself from getting hurt? What would you suggest for the young person who might be interested in 'becoming an expert' just like you?

3. Make a class cookbook

Let students bring old family recipes for special occasions from home. Perhaps students have a special delicious apple pie, fudge, granola, or salad recipes they are willing to share; a family secret recipe, just waiting to be discovered. Write out the directions carefully, describing how the food should look, taste, and smell. Put these together in a book, illustrate them, and xerox for holidays and special occasions.

MAKING A DIFFERENCE
Responding in Writing to Contemporary Events

INTRODUCTION

Students can have an impact in their own communities and in our larger society by writing letters that express their views on important issues. Perhaps there is a 'burning issue' that concerns your community -- a new seatbelt law, a local policy on homework, a playground that is now off-limits, a school closing. These issues can seriously affect you and your students. As we all know, however, discussions about solutions are not enough. Writing--putting one's thoughts and opinions on paper in letter form to local and state officials--is one important way for students to make a difference.

Civic writing encourages children to think about contemporary events outside of the planned curriculum and gives them opportunities for persuasive writing. It requires that they think about their audience, with a specific purpose in mind. Civic writing stems from feelings about social or local issues and aims to treat these concerns in a forceful, tangible way.

Civic writing is exciting for students because they will usually get back a written response. Officials who are closely related to state or local government are particularly likely to respond to student letters.

The word processor adds a helpful dimension to civic writing by allowing students not only to write and revise their work easily, but to present their ideas in a professional, official-looking document. Civic writing is a serious response to an issue, one that requires thoughtful analysis, and careful arguments and solutions. It can also teach an important lesson--childrens' opinions and thoughts in writing can indeed make a difference.

(Note: Sandra Stotsky's extensive work on civic writing forms the basis of this module.)

Objectives

- Become familiar with a contemporary civic issue
- Be able to present several sides of all issues in writing
- Learn the key features of a persuasive letter
- Write a persuasive letter on a civic problem

Key Features of Persuasive Writing

- Intends to convince readers of a particular position
- Presents a problem and offers a solution
- Uses arguments to support the solution

Word Processing Skills

In addition to skills used previously, students may learn to use the TAB function, and may choose to change the TAB settings on their word processor. Students will learn the basic procedures for making a simple data base.

STEP 1: FIND A PROBLEM

Students will identify a problem and work together to define it and discuss possible solutions. You will use the computer to begin to develop a data base of information about the problem. This data base will enable you and students to file ideas and solutions that students generate.

During Class

1. Getting Started

Depending on students' abilities and level of independence, you may choose to work on a single issue as a class project or to work on several issues. For fourth graders it is usually best to have all students focus on the same issue.

There are a number of ways to get started in civic writing:

- Bring to class an article on a topic relevant to students' lives. This article might be from the town newspaper, a resolution from a town meeting, an article from the editorial section of the paper.

- Ask students to find a problem that needs attention. This might be a school-based problem, or one that concerns many people in the community.

- Assign a problem for students to research. For example, toxic waste may be of real concern in the community, or dogs may be unleashed and provoking complaints. These problems call for additional information, which might be gathered through phone calls, gathering print information, visits to local officials, or if you decide to extend the project in this way, speakers to come to the classroom.

2. Form buzz groups

Once you have identified a topic that matters a great deal to students, divide the class into small groups, to pool the ideas and information they have at this point about the issue. (This works best with heterogeneous groups.)

These questions can help them pool their "prior knowledge:"

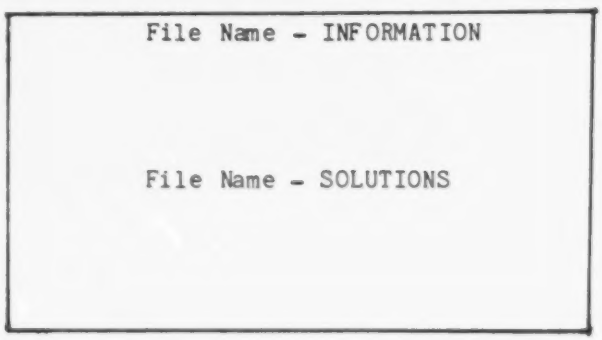
- What is the problem?

- Why is it a problem?

- What can we do about it?
- What new information do we need?

3. Begin Data Base Files

The computer can help combine the ideas and information from each small group. To demonstrate this, be the "typist" on one computer, entering ideas quickly as someone from each small group summarizes their discussion. Show students how you are creating files to be added to over the course of the module, for example: "Information about the Problem" and another on "Solutions to Consider." To demonstrate the use of files as organizing tools, first create the INFORMATION file. Ask students to summarize information about the problem and kinds of new information they need. Then create the SOLUTIONS file and list the solutions students have brought up at this point.



Print out multiple copies of each file, so that each small group can have one to continue their work. As students expand their information and develop further solutions, they can enter them into files that they set up themselves on "group discs."

These early discussions should lead to many different possible solutions. If they have not, encourage students to expand their ideas during discussion. It is important that all sides of an issue are raised and that students have a choice in the focus they eventually choose.

STEP 2: DEVELOP A SOLUTION

Students will gather additional information about the problem. Drawing on that information, they will use a structured planning tool to generate and organize a series of arguments for and against the solution they propose.

During Class

1. Gather Information

Have students work in small groups to gather new information on the issues. You might assign one group to work in the library, one to send for additional information, one group to do some investigative reporting by calling some officials. Some groups will find they use the TAB function to organize

information on the disc. In the example below, students have chosen the problem that a favorite community playground may be sold to a developer as a condominium site. Students decide on a number of people to call to find out whether this is true, and who is responsible for selling the land.

They may want to learn the TAB function in order to organize the information they get from each person by date, person and points made:

Jan 8	Mr. Wilkins, Mayor	Land does not belong to the town. Call Land Office to find out who owns it.
Jan 10	Mrs. Brown, Land Office	Land belongs to the Jefferson family. Mostly elderly.
Jan 10	Mrs. Tomson, John's mother's friend	Park in her neighborhood. Likes it and didn't know it might be sold.

This kind of group data file enables students to enter their information at different times, when they are ready. It ensures that each student can make a contribution, even by typing in the results of a telephone conversation carried out by another group member. The group data file makes the information visible to the other members of the group, who can decide together when they are ready to print it out for the whole class.

The specific information-gathering activities you choose for your students will depend on the issue the class chooses and your assessment of students' level of independence.

2. Use a Planning Tool

When the groups have gathered their information, each group can print out its information file in multiple copies, for the other groups. Before students begin to work on their own, they should look over all the information that has been gathered. As a whole class discuss:

- What do they know about the problem now that they didn't know before?
- What is the main problem?
- What are some possible solutions?

Following this class discussion, let students go to the computer, using the planning tool on the next page. Now that they know the TAB function, students can enter the tool on their own discs.

Have each student independently select his/her own solution and write on the computer about why this is a good solution, and any arguments against it.

3. Share Plans

After students have finished their planning notes, have them share their ideas in small groups or pairs.

Planning Tool

The Problem:

Your best solution:

Arguments for:	Arguments Against:

STEP 3: WRITE A LETTER

You will demonstrate the format for a letter. Students will then compose a letter to an appropriate official, bringing the issue to his/her attention.

Before Class

Gather names and addresses of officials who will be responsive to your issues. The class might all write to one official, or several. Keep in mind those local figures who might be most likely to respond personally to students' letters.

During class

1. Model letter writing

Demonstrate how to write a business letter on the computer, including heading, signature, etc. Understanding the TAB function will again be key here.

2. Plan

Have students decide who they will write to, then give them the structure below, for organizing a persuasive letter.

How to organize a persuasive letter

Problem:

Solution:

Arguments for your solution:

Restate solution:

Appeal for action:

3. Write

Students may go to the computer and make notes under each of the these categories. Some students may use this as an organizing frame for simply writing the letter. They can erase the prompts after their first draft is written.

Students may take several class sessions on this letter.

STEP 4: REVISE AND EDIT

Students will work in their same small groups to revise and edit their letters. They will send their letters and wait for a reply.

During Class

1. Revise

Encourage the group to act as an editorial board. Each student reads his/her letter aloud. Have listeners respond by making these kinds of comments:

- Have they stated the problem clearly?
- Were their solutions clearly stated?
- If they were the official, what might their response be to the students' letter?
- What other information could be included to add to the forcefulness of their arguments?

Students should revise their letters to reflect insights gained from the discussion.

2. Student Edit

Have students proofread other students' work in the small group. Proofreading multiple times will help to catch errors. Have students save and print a draft of their letter.

3. Teacher edit

Correct any final mechanics errors. Save and print a final copy.

4. Send

If these letters are all to be sent to one official, show students how you have addressed the envelope. If the letters are being sent to a number of people, show students the format, and allow them to address the envelope themselves. Then wait for a reply!

5. Share

Students are thrilled when officials reply to their letters. Be sure to read them to the classroom for all to enjoy. This process of writing letters and receiving answers powerfully demonstrates to students the communicative purposes of writing.

EXTENDED ACTIVITIES

1. Write a letter for free materials

The Rainbow Book, among others, is a resource of names and addresses of companies which send free items to children. They may be pamphlets, free seeds for their garden, decals, or other objects. Receiving free materials in the mail is a clear motivational tool for developing letter writing techniques.

2. Respond to real life problems

After reading the vignette on the next page, Willie Johnson, students can pretend to be the principal, the mother or the father. Do the following:

- Write the note that Willie Johnson received from the teacher.
- Write a response to the note from mother or dad.

WILLIE JOHNSON

Willie Johnson was in trouble! He had thrown his paint water at Sue Nelson and the teacher had become angry with him. "Why did you do that Willie?" she had asked. Willie couldn't tell her, becuase he really didn't know why himself. He knew that Sue had teased him a little, but that wasn't the real reason. He just did not know! The whole thing put him in a bad mood. From then on, the entire day just went to heck.

In the afternoon he had pushed Tommy Smith in the recess line. He also stamped his foot and yelled at the teacher. The teacher had become angry again. But this time she had pinned a note to his mother on his jacket.

That note! Willie knew it was about his behavior in class during the day. He knew that when he got home his mother would read the note and give him some kind of punishment. Then his father would find out and he'd really get it!

On his way home from school Willie was thinking about what his father would do to him. Oh brother!

"Wow," he thought. "I'll get killed if I bring this note home. I'd better take it off and throw it away."

He was just about to do that when he remembered what had happened to Billy Beatty when he was sent home with a note. Billy had thrown his note away and was sent to the Principal's office about it. Then Billy was in double trouble!

Wow! He was in trouble! He couldn't give it to his mother, he couldn't throw it away. What should he do? He had a problem, all right. He had to make a choice, but how should he choose? No matter what he did, the outcome didn't look too good! What should he do?